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Gleanings in Bee Culture

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Happy New Year

Production of Honey in Shallow Frames

By Dr. J. E. Eckert
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The beginner in beekeeping is often perplexed by the numerous steps in the production of honey, either in the comb or extracted form. It is not only difficult but expensive to produce section honey and the beginner should not attempt it. Extracting equipment is also expensive when one has only a few colonies and in these days of scarcities and of substitutes, equipment is becoming increasingly difficult to obtain. Consequently, the most suitable equipment for the beginner to use consists of two hive bodies, a queen excluder, and two or more shallow supers per colony. A good colony in an average season will fill two or more shallow supers of honey and store sufficient honey in the second hive body, used as a portion of the brood chamber, to carry the colony over the winter period. Proper manipulation of the second brood chamber and the supers will aid in swarm control.

Where honey is produced for home consumption only, the surplus can be stored in the original frames and used as needed. When a surplus above the family needs is secured, the honey can either be sold in the frame or cut out and sold as cut comb honey, or the comb cut out and the wax and honey separated by heating.

If the comb honey is sold locally by the frame, each frame should be carefully wrapped in waxed paper after it has been scraped clean of burr comb and propolis. A small amount should be refunded on the return of the frame. An appropriate label indicating floral source, net weight, and producer, can be placed beneath the transparent paper, if desired. This is the simplest means of disposing of surplus honey.

Another method is to cut the comb of each shallow frame into five equal pieces of approximately 10 ounces each. A hot thin-bladed knife should be used. A smooth board marked with the proper sizes of pieces to be cut simplifies and speeds up cutting into regular portions. The cut pieces should then be placed on a wire screen of quarter-inch mesh to allow the honey from the cut cells to drain out. The time for draining depends on the temperature of the room and the thickness of the honey. Generally 24 to 48 hours is sufficient at summer temperatures. In handling the pieces of honey, a U-shaped piece of wire screen, of quarter-inch mesh, about 4 by 10 inches in size, is very convenient. The screens can be placed over shallow biscuit trays to catch the honey. A small cabinet to hold a number of these trays will

keep the honey free from dust and away from insects during the draining process. A heated iron can be used to seal the wax paper wrapping and a label can be placed on the surface of the comb under the transparent wrapping. For local sales no additional protection need be given the comb in the form of additional paper or cardboard. If sold through a grocery store, an attempt should be made to have the honey placed on the counter next to the cash register where its sale may be supervised by the cashier. (Incidentally, this is the best display space in a grocery store.) Such 10 ounce sections will sell readily for 20 to 25 cents each, and return a good wage to the producer.

The separation of honey from the comb, without an extractor, is a more complicated procedure, but the same principles can be used as are needed in the separation of honey from cappings produced in extracted honey production. The honey comb can be cut from the frame, crushed, or mashed into small pieces and the honey allowed to drain away from the broken comb. The broken comb should be separated from the surface on to which the honey drains. If the entire receptable is heated to near the melting point of beeswax (about 145° F.) the honey will drain away rapidly. Heat should be applied indirectly, as through a water bath and never directly to the honey or honey comb. If the honey and comb are melted together, the wax will rise to the surface of the honey and will solidify as it cools. The comb and honey need not be heated more than 145° F. in which case the honey will not be injured very much either in color or flaver if cooled soon after the wax is melted. The honey and wax may be heated to a higher temperature if the honey is separated from the melted wax immediately and then cooled. Honey is injured in both color and flavor if left too long in contact with melted wax, especially so if the wax cames from dark brood combs, or if the honey is held at 145° F. or higher for too long a period.

Honey may be pressed cold from comb by using the principle of the small cider press or a modification of the wax press. Some commercial beekeepers uncap their combs into a large box made of narrow strips of wood and lined with burlap and use a hydraulic jack between a top board and heavy truck springs to provide the pressure on the cappings to squeeze out the honey. The cappings are then melted in a steam separator or in a solar wax extractor. All honey secured from the press is uninjured and that which comes from the solar extractor can be used for manufacturing purposes or to feed back to the bees.

The Peterson, Brand, Superior, and other cappings melters employ the use of heat in separating honey from cappings as they are cut from the comb. The Peterson cappings melter lends itself to a simple modification that will improve the quality of the honey secured from either cappings or from cut combs. The melter we have has a corrugated bottom of galvanized iron above a water jacket to which heat is applied. If all-wire queen excluders are placed on the heated surface and the cappings or comb allowed to fall on them instead of on the bottom of the melter, the honey will drain away rapidly and show practically no injury to color or flavor, especially if the temperature of the water is kept below the boiling point.

Another point to consider in this melting process is the separation of the wax from the honey. The smaller the amount of honey that collects at any one time under the heated wax, the less honey there is to be injured by this contact. A cheap efficient wax-separator can be made from a 12 to 16 quart galvanized iron pail by soldering in close to one side of the pail a baffle plate that extends to within one-half inch of the bottom. A honey outlet should be made in the side about six inches from the bottom of the pail, with a spout attached, so the honey can run under the baffle plate and out into another receptacle. Two of these pails will be sufficient to hold all of the wax that will be melted from cappings or cut combs in the extraction of at least 3000 pounds of honey and the cakes of wax can be lifted off of a minimum amount of honey the following morning. The honey left beneath the wax in the separator will be of better quality than if the excluders were not used. After most of the honey has drained from the cappings, the excluders can be turned over with the wax next to the heated surface. The residue should be melted in water and run through a wax press.

Davis, Calif.

Investigations on the Physical and Chemical Properties of Beeswax

By Charles S. Bisson and Geo. H. Vansell
Condensed from Technical Bulletin No. 716 U. S. Department of Agriculture

[In these days, especially when the demand for beeswax is very great, the producer should realize more than ever before that scrapings of propolis should not be added to the beeswax, especially to light colored beeswax. This practice actually changes some of the physical and chemical properties of the wax to such an extent that for many purposes it is worth less than bright yellow wax. It is better to burn such scrapings than to mix them with good wax thereby contaminating it so that the selling price is reduced possibly 2c a pound.

The following paragraphs from Bulletin 716 are particularly timely now, even though mention has been made of the bulletin before in these columns. Pure beeswax rendered from old combs is comparatively rare for it is likely to be contaminated both with propolis and with pollen and further darkened by metal. Truth often hurts but these needed warnings should serve as a spur to greater effort for purer beeswax.

Interesting tables and other large portions of the bulletin are omitted because of the lack of space. Copies of the bulletin may be obtained for 5c by addressing the Superintendent of Documents, Washington, D. C.—Ed.]

Introduction

The general trade has discriminated against certain types of western beeswax in favor of beeswax from other regions, both within and outside the United States. The basis for such discrimination obviously lies in differences in the properties of the waxes, but since virgin beeswax or scale wax as produced by the bee, seems to have uniform physical and chemical properties, the differences are due to changes to which it is subjected after secretion. The color and texture of the white virgin wax are altered in the combs by contact with certain pollens and with metals used for wiring frames, as well as by contamination with propolis, which is abundant in some sections of the West. The chemical characteristics, especially acidity and iodine number, are decidedly altered by the admixture of propolis, and the various methods of rendering produce further changes.

Contaminating Materials

Wax scales are subject to various kinds of contamination immediately after they are produced. Within the hive contamination begins when the scale wax is manipulated into the comb by the mouth parts of the bees, to which dust and pollen adhere. The wax in the comb, furthermore, is constantly in contact with propolis, pollen, honey, dust, and brood or its food or decomposition products. Under such conditions solid particles become imbedded in the wax surface, and wax-soluble odoriferous substances, coloring matter and the like diffuse into the wax. Further contamination occurs when comb or cappings waxes are rendered, because the hot wax dissolves propolis, pollen, coloring matter, and foreign substances contained in the brood. Hot wax usually darkens when in contact with honey or water in vats made of certain metals.

The dispersed solids in crude wax have been found to consist chiefly of dust, insect remains, bits of straw and leaves, pollen grains, rust and many other materials with which the wax has been brought in contact during handling and processing.

Deviation from either the physical or the chemical values of the scale wax, as observed in the crude or treated samples, indicates contamination.

Propolis

Many plants produce bud-coating gums, called propolis, which are insoluble in water and are collected by bees for various uses within the hives. Propolis is therefore a very common constituent of the impurities dissolved in beeswax. Some natural contamination of the wax occurs because the bees use propolis to varnish surfaces and fill spaces between the frames that are too small for them to enter. Much more propolis contamination results from mixing and rendering "scrapings wax" with crude wax from other operations.

Several samples of propolis were collected from beehives located in widely separated districts. At room temperature some of the samples were soft and sticky, whereas others were hard and brittle. The color ranged from light yellow through reddish brown to very dark brown. Jaubert* reports that the yellow color of the comb wax is due to the

*Jaubert, G. F. Sur L'Origine De La Coloration De La Cire D'Abeilles Et La Composition De La Propolis. Compt. Rend. Acad. Sci. (Paris) 184:1134-1136. 1927.

presence of chrysine (1, 3-dioxyflavone) originating from propolis. Most of the samples had a spicy pungent odor somewhat distinctive of the plant source, whereas others had very little odor. Most of them tasted bitter.

Propolis placed in melted beeswax dissolved partly or completely and imparted to the wax many of its physical and chemical properties. Samples of beeswax that were high in propolis, such as Nos. 43, 44, and 45, were distinctly sticky and possessed other abnormal characteristics, such as high density, index of refraction, and acid and iodine numbers.

Certain light samples of propolis darkened greatly when heated in boiling water for 7 to 10 hours. The colored waxes known to contain propolis also darkened when heated for 7 to 10 hours in glass beakers at about 75° C. In some cases a lower layer of very dark reddish-brown liquid separated from the melted wax when it was allowed to stand undisturbed.

Pollens

Pollens constitute another important source of color in beeswax. Some highly colored pollens contain oil-soluble colored substances, usually yellow or orange, which are readily soluble in molten beeswax. If pollen grains containing these colored substances are brought into contact with white scale wax, the coloring matter in most cases diffuses into the wax slowly at room temperature but very rapidly at temperatures above the melting point of the wax. In several experiments white wax was exposed at 68° C. to fresh pollen grains from various sources. In some cases the wax became colored, whereas in others no color change occurred.

Metals

Since all comb wax has pollen grains imbedded in it, coloration is very likely to occur during the rendering process. Other substances not colored may also be dissolved by the wax and affect the chemical behavior of the rendered wax. In the process of rendering or remelting over water in iron trays, the yellow color of the crude wax is masked by a dark-brown or black appearance.

Experiments were performed to determine how contact with metals in both the dry and wet states affects the color of various waxes. The wax samples were melted in beakers in contact with the metal or in pans composed of the metal to be tested. They were heated over a steam bath (100° C) for varying periods of time, and color changes noted by comparison with a portion of the original sample.

The white waxes discolored much less than the crude. Probably the impurities in the crude waxes were responsible for the color changes. The crude waxes that contained much propolis, such as No. 43, discolored very rapidly in contact with iron, darkening slowly even when heated in glass. Part of the propolis changed to a very dark substance, which separated from the wax. This resinlike portion was hard and brittle after cooling. Crude wax containing little or no propolis showed practically no change in color when heated for a few hours in glass, platinum, aluminum, or stainless steel. The presence of water greatly accelerated discoloration of the crude wax by iron. The zinc coating on the galvanized iron in the test in which water was employed was soon dissolved by chemical action of the solution, leaving the iron fully exposed to further chemical action. Heavily tin-plated iron was practically without effect as long as the tin coating was not abraded to expose the iron.

Several additional tests were conducted with filtered white wax from a commercial refining plant. These waxes become discolored by heating in the presence of water with iron, brass, zinc, or copper, the discoloration decreasing for the metals in the order named. No appreciable discoloration resulted from heating under similar conditions with aluminum, nickle, platinum, pure tin, and stainless steel. Monel metal had no effect on these waxes when dry but when water was present a greenish discoloration developed after long exposure.

These laboratory tests, together with consideration of cost and practicability indicate the desirability of using aluminum for commercial rendering and certain other processing equipment.

SUMMARY OF THE ENTIRE BULLETIN

The physical and chemical properties have been determined on 60 samples of crude beeswax, obtained for the most part from beekeepers in California and other Western States, and these properties have been com-

pared with those of freshly secreted scale wax and also with the properties of many of the same crude waxes after they had been discovered by various processes.

For freshly secreted beeswax the properties are nearly constant, but with changes in the quantity and kind of contaminating impurities some or all these properties change. The physical and chemical properties of the impurities, and not of the waxes as a whole, must therefore be used as the basis for classifying crude beeswax.

The impurities in crude beeswax consist of honey, suspended particles, or dissolved substances, and may or may not be colored. The soluble colored material are attributable to substances extracted from pollens, to propolis, and to substances produced by contact of the wax with metals. Darkening of crude wax by contact with iron or oxides of iron is very common.

The crude waxes that were highly contaminated with propolis showed higher densities, indices of refraction, acid numbers, and iodine numbers than those containing little propolis but appreciable quantities of other soluble contaminations. Samples high in propolis could not be decolorized by sun bleaching or adsorption, and they were decolorized chemically only with difficulty.

When melted crude waxes were treated with certain dilute acids, brown waxes became yellow, but the yellow color was not removed.

In tests of the complete removal or destruction of colored impurities by action of sunlight, adsorbent solids, and chemicals, the individual waxes differed greatly depending on the nature of the colored impurity. This fact indicates the necessity for establishing the chemical structure of these colored constituents and also their specific physical and chemical properties.

The effect of the method of decolorization on the composition of the wax is reflected to the greatest extent in the differences between the chemical properties of crude waxes and the corresponding refined waxes. The ash content was lowest in the waxes refined by sun bleaching. This process, however, was not so widely applicable to all waxes as the chemical method, which in every case produced a nearly white product with a relatively high ash content.

Wax bloom has been shown to be a mixture of organic compounds of low final melting point and narrow melting range.

Preliminary experiments on the absorption spectra of extracts of crude beeswaxes and of pollen suggest the possibility of determining that the same colored substances may be common to some crude beeswaxes and pollens.

A pretty apiary near the famous village of Broadway, Worcestershire, England.—Photo sent by A. H. Bowen, Cheltenham Spa, England.

When Help Gets Scarce

By Chas. Mraz

A most common complaint we hear and read about from beekeepers is the shortage of help. Having found myself alone this fall with supers to stack away and bees to pack for winter, I finally got the work done with the help of two women. Originally they were hired to help me pack comb honey, but when they found out I intended to pack my 700 colonies of bees alone, they offered to help. I must admit I had some misgivings about taking them into a bee yard, but as it turned out, they took the stings better than most men or boys.

My packing was finished this year by October 20, two weeks earlier than I've ever had them packed, thanks to good help. In many respects they are superior to boy help that I have always used by being more conscientious and trying to do their work right. When it came to stacking the supers in the honey houses they did a better job than I could do myself. Women can be a lot of help in a bee yard if one is fortunate to get some who like that kind of work, and by the looks of things beekeepers will have to use lots of women help if they are to get their work done next season.

The first picture gives some idea of our method of winter packing. All of my 700 colonies have a sheet metal permanent packing case. In this picture the girls are picking up bits of wax that accumulate inside the packing case during the summer. These bits of wax add up to more than a 100 lbs. a season. Also note the supers stacked on top of the inner cover after extracting. This gives the bees a chance to clean out the honey and protect the combs from wax moth.

Each yard has a honey house 8x10 feet where supers are stored, about 200 supers to a yard of 50 colonies. The tube or upper entrance can be seen in this picture. The large lower entrance is closed down with a metal slide making the lower entrance 6"x-¼" for winter. The upper entrance is a ¾" tube. Each hive has a shallow super or food chamber full of honey for winter. This packing case allows 3" of shavings on the sides and 6" of shavings on the top where a shallow super is used for food chamber. For the past 8 years with this type of packing, wintering has never been a problem with us. A queen-right colony seldom dies out in the winter. Last year out of 700 colonies, less than 10 died out during winter.

This metal case has many advantages; it is cheaper than wood, much

No. 1. The girls are collecting the bits of wax that accumulate inside the packing cases in the summer. The sum total of these bits of wax is well worth the time used in collecting them.

No. 2. The dry pine shavings used in packing are being poured around the hive.

No. 3. The girls have finished packing a hive and are ready to put the cover in place.

easier and faster to build, rot and mouseproof. Packing and unpacking is a far easier job than where paper is used. Fifty colonies can be packed in two to three hours, and unpacked in about the same time.

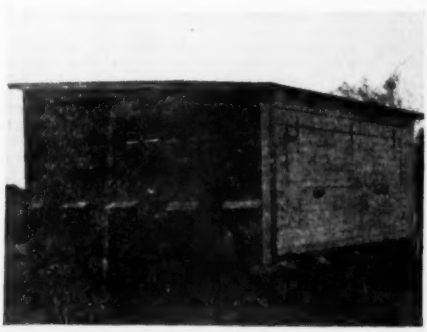
Picture 2 shows the girls packing. We use dry pine shavings as they are very easy to get here and make excellent packing. No. 3 shows a hive all packed and cover being placed on. Loose shavings are only used around the sides of the food chamber. A bag of shavings is used on top.

Middlebury, Vermont.

BEES KEPT IN A BOAT HOUSE

On page 662 of the November issue, Mr. Leo T. Murray, Waco, Texas, told of keeping his bees in a boat house.

These pictures show the front, side and inside of the building which houses the bees.



XUM

O. P. A. Issues Honey Price Ceiling

By the Editors

On November 28 the Office of Price Administration issued a long awaited ceiling on the price of honey. This is known as Maximum Price Order No. 275 which takes the place of the General Maximum Price Regulation. Under the latter the price of honey was set for the packer, the wholesaler, and the retailer on the basis of the highest price charged in the month of March, 1942. Under the old Regulation many retailers were forced to discontinue the sale of honey because of the marked increase in price since their last purchase.

The new price ceiling on raw bulk honey was set at 112.2% of parity or 12c per pound for U. S. grade No. 1 extracted honey f.o.b. the beekeeper's shipping point. Where cans are returned to the seller the ceiling price is placed at 11½c. The freight on the empty container is to be paid by the purchaser. For honey whose quality is under U. S. grade No. 1 customary dollar and cents trade differentials are to be applied.

In general, then, we can say that the price to the beekeeper is 12c a pound in bulk for raw honey with customary lower prices on lower quality honey. This portion of the order is simple and there seems to be very little room for misunderstanding.

The portion dealing with the packer's ceiling price is rather complicated but, in general, it gives the packer the same dollar margin that he had during September, October, and November, 1942.

Wholesalers and retailers of package honey are not covered in Regulation 275 but will be covered under Wholesale and Retail Regulation No. 255 and No. 256. The wholesaler may add his packer's permitted increased figure (but no more) to his own top price during February, 1942. The wholesaler then must notify the retailer of the specific amount of this permitted increase (the first time after his new maximum price has been set). (The retailer selling honey may add this same permitted increase, thus arriving at his new maximum figure.) Copies of the order may be obtained by writing to the Office of War Information. We are printing below the advance release dated November 28, 1942, that accompanied the order.

OFFICE OF WAR INFORMATION
OFFICE OF PRICE ADMINISTRATION

Advance Release: OPA-1184
For Saturday Morning Papers,
November 28, 1942.

In a move designed to restore "packaged" extracted honey to retail store shelves—which have been virtually barren of honey because March, 1942, ceilings did not reflect replacement costs—the Office of Price Administration today took price action affecting this commodity at every stage from the time it leaves the beekeeper's hands until the housewife makes her purchase at the neighborhood store.

OPA's action, restoring the normal movement of honey, will necessitate an increase in the price to the consumer of approximately seven cents per pound over that at which the 1941 low-cost supplies—now virtually exhausted—were sold.

New pricing controls on honey will do the following:

(1) Beekeeper-producer sales of Grade U. S. No. 1 "bulk" honey are set in dollars and cents for specific 12-cent per pound ceiling, f. o. b. seller's shipping point. (The term "bulk" honey refers to the commodity in a container of a capacity of more than 10 pounds). For other grades, sellers at this level will establish maximums by reducing the ceiling price established for Grade U. S. No. 1 by the customary trade differentials in effect during the September-November, 1941, base period.

(2) Distributors' maximum prices for both "packaged honey" and "bulk honey" are established by use of a formula giving the distributor the same dollar margin that he had during the September-November, 1941, base period. ("Packaged" honey means the commodity in a container of not more than 10 pounds. Distributors include honey packers and processors.)

Under this formula, the processor determines the price which he obtained for a particular item of honey from certain designated classes of purchasers during the September - November, 1941, base period. The processor then determines his increased cost of honey, labor and transportation occurring since the 1941 base period, which he adds to the base period price. The result is the packer's new ceiling price. Processors must give written notice to wholesalers and retailers of the increase which the processor has been allowed under the formula. This must be done at the time of the first sale after the packer's new maximum price has been established.

Up to this stage, all pricing activities are covered by Maximum Price Regulation No. 275 (Extracted Honey) effective December 3, 1942. Wholesalers and retailers of "packaged honey" are not covered in this regulation but will be covered under wholesale and retail regulations No. 255 and No. 256, amendments to which will be issued within the next few days.

(3) The wholesaler of "packaged honey" may add this processor's "permitted increase" figure—but no more—to his own top price during Febuary 1942. The result will constitute the wholesaler's new ceiling price. The wholesaler then must notify the

retailer of the specific amount of this "permitted increase" the first time after his new maximum price has been set. This action at wholesale will be effected by adding honey to the list of commodities covered under Maximum Price Regulation No. 255 (Pemitted Increases for Wholesalers of Certain Foods), under an amendment to that order.

(4) The retailer selling honey may add this same "permitted increase" to his March ceiling price, thus arriving at his new maximum figure. This move, thus, providing the final step by which the processor's "permitted increase" is passed on to the ultimate consumer. This will be taken in an amendment to Maximum Price Regulation No. 256 (Permitted Increases for Retailers of Certain Foods).

A "notice of retailer's permitted increase" must be either pasted or stamped on the outside of each shipping case of "packaged" honey sold or printed on a slip enclosed. This notice must be provided by the person selling to the wholesaler. The wholesaler then must pass on this notice to the retailer.

The new 12-cent per pound ceiling set for Grade U. S. No. 1 extracted honey in bulk reflects a price to the producer equal to 112.2 percent of parity. It also is the highest price at which such honey sold between January 1 and September 15, 1942, thus complying with the Emergency Price Control Act of 1942, as amended.

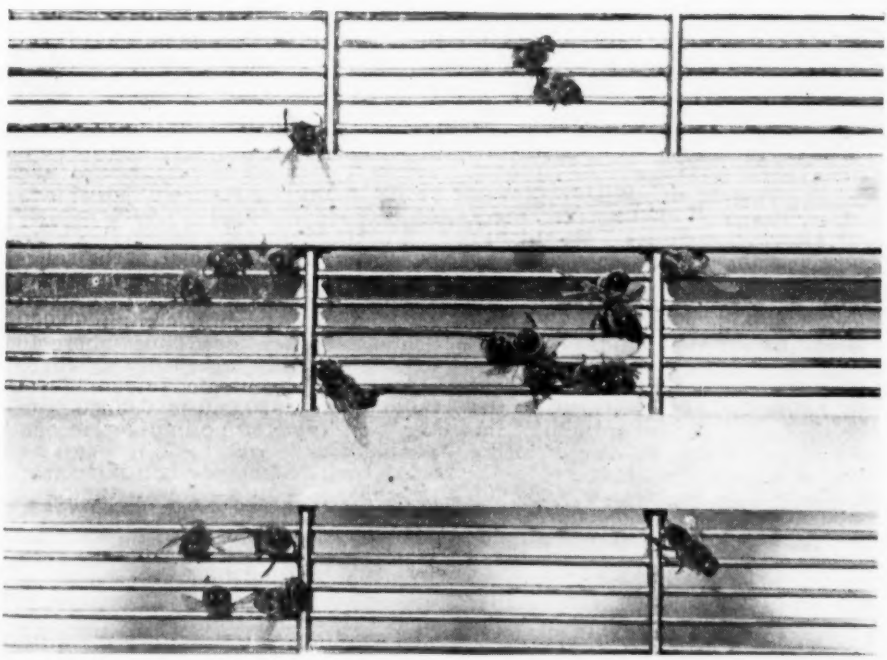
OPA's latest action will restore honey to the list of commodities once again available on store shelves. Distribution of "packaged honey" virtually ceased, since March ceiling on "packaged honey" in many instances reflected costs of "bulk honey" which was purchased during the latter portion of 1941. Low cost inventories held by packers are now exhausted.

During 1941, the average price of honey was 4.87 cents per pound. By the end of the first quarter of 1942, however, bulk honey prices had advanced to around 11¾ cents, while packers and processors still were selling at prices which mirrored their inventory, rather than replacement costs.

The General Maximum Price Regulation, which hitherto covered honey sales, froze the selling prices of processors and packers at the March level. The result was a relatively high price level for "raw material" honey and a relatively low price level for "packaged honey." This is adjusted by the new regulation, which takes into consideration the new costs incurred by honey packers.

Although the "permitted increase" definitely will vary, depending upon the processor's base price and increased cost, it is indicated that in a large percentage of cases the raise will approximate seven cents per pound.

Drones Caught in Excluder



When there are a large number of drones in a hive they sometimes get hopelessly stuck between the wires of the excluder. Like a pig under a gate they can neither wiggle on through nor back out again.

Honeybees - - Clover Seed Boosters

By W. E. Dunham

Extension Beekeeping Specialist for Ohio State University, Columbus, Ohio.

More Alsike and Red Clover Seed Needed.— Because of the increased production of livestock and livestock products brought about by the War Emergency, the Government suggests large increases of all legume seeds. At least 28 per cent more alsike seed and 54 per cent more red clover seed should be produced. Ohio is one of the leading states in growing alsike and red clover seed, and should contribute its share to this increased seed program.

Pollination Insures Seed - Set.— Alsike, red, and white Dutch clovers are practically self-sterile and depend on cross-pollination to produce seed. Research at the Ohio Experiment Station, as well as at other Stations, shows that, when pollinating insects are excluded from the clover blossoms, not more than one to three seeds develop per head. Cage tests on alsike and red clover bloom, with honeybees as cross-pollinizers, show that not only are these clovers dependent on insect pollination but that they have a heavy seed formation when insect visitors are plentiful. Under maximum honeybee pollination, alsike enclosed in cages yielded 120 to 155 seeds per head. This represents from 15 to 20 bushels of seed per acre.

Honeybees Necessary for Profitable Production of Alsike Clover Seed.— Research studies in many seed growing counties reveal that natural pollinating insects such as bumblebees, solitary bees, flies, butterflies, etc., are entirely too few to insure profitable seed crops of alsike clover. In all the fields checked, where only natural pollinating insects were present, the farmers cut such fields for hay, because of the poor seed-set. The magnitude of the work of pollinating an acre of alsike clover is apparent when we consider that there may be from 300,000,000 to 500,000,000 blossoming florets per acre. It was found that when fields of alsike were within a mile of a commercial yard of bees ranging from 45 to 200 colonies, the number of seeds per clover head were from 41 to 90.

Honeybees Help in Red Clover Seed Production.—Three years of experimental work in western Ohio shows the alarming scarcity of natural pollinating insects on red clover bloom. Bumblebees are our best red clover pollinators, but, because they are so few in number, they cannot be depended on. Of more than 20 different kinds of insects that pollinate red clover, honeybees were, during the years 1930, 1931, and 1932, responsible for from 75 to 85 per cent of such work; bumblebees, from 13 to 17 per cent, and all other insects from 2 to 5 per cent.

Honeybees Assure Self Seeding of Clovers in Pastures.—White Dutch and Ladino clovers, so desirable in pastures, are largely dependent on honeybees for pollination and the production of seed. During the drouth years of 1930, 1934 and 1936, these shallow rooted clovers were killed over most of Ohio. In those areas where a well distributed honeybee population covered the pasture areas, a volunteer crop of both white Dutch and Ladino clovers appeared as soon as the moisture and weather conditions were favorable for the germination of the seed already in the soil.

Better Utilization of Honeybees Will Boost Seed Yields.—The most immediate method for meeting the clover seed quota suggested by the government is for farmers located within 1½ miles of commercial bee yards to place every emphasis possible on clover seed production.

Throughout western Ohio there are hundreds of commercial yards ranging from 40 to 100 colonies in a yard. Each colony of bees which has been well managed should contain 60,000 or more worker bees. Thus, where 40 to 100 colonies are located, there would be concentrated at one focal point from 2,400,000 to 6,000,000 of the best type of pollinating insects available.

At best, red clover is a poor seed producer. With a normal stand and with each floret of all heads producing a seed, the theoretical yield would be about 12 bushels per acre. However, during favorable years for clover seed, from 4 to 7 bushels of alsike seed and from 2 to 4 bushels of red clover seed per acre is quite possible, **provided** there are enough pollinating insects present to insure cross-pollination of the clovers.

Bee Breeding

Laying Workers and Their Progeny

By T. W. Millen, B.Sc., M.Sc., D.V.M.

(Taken from "The Indian Bee Journal" July and August 1942.)

We usually look on the queen bee as the mother of the colony. Her main function in life is to lay thousands of eggs. She is the central focus for the whole colony and during broodless and droneless periods represents its only potential source of new life which will be fully exploited as soon as conditions become more favourable. If for any reason the colony loses its queen mother and no source of a virgin queen is available to them the bees still attempt to carry on the reproduction of life. Some believe the individuals which become laying workers, sometimes called fertile workers, have been reared near queen cells and have received more royal jelly in their youth than is usually given to developing worker larvae.

In any case the bees recognize these bees as being different from the majority and start feeding them. At first their presence is not easily detected by the apiarist. For a day or two they usually place only one egg in each cell in a manner similar to the practice of the queen mother. Very soon, however, many eggs are found in the cells and as time goes on the brood begins to develop. Although many eggs are often deposited in a single cell and several larvae may develop simultaneously only one is sealed in the cell. The one at the cell bottom pushes the others out as it develops and assumes the horizontal position. The bees usually cover this brood with the typical raised drone capping but it is much more patchy than that secured from a good queen. Also, these drone cells are scattered all through the comb in both the large drone cells and in the smaller worker size cells. In due time many drones emerge and soon they become in the majority in the colony. Since no more workers are being produced and the ones already present rapidly become decimated due to advancing age, the colony is doomed. It falls prey to one or more of its enemies as soon as its ranks are sufficiently depleted.

In the summer of 1937 and 1938 the author did some research at the Iowa State College Apiary at Ames, Iowa, U. S. A., on the time and conditions required to produce laying workers and secure progeny from them. Italian and Caucasian bees were used in the experiment. In not one of thirteen colonies did the bees produce laying workers while they had eggs, young brood, queen cells or an individual that they recognized as a virgin whether she was caged or free in the hive. In one instance the bees had an individual intermediate between a queen and worker that they had undoubtedly reared from a larva too old to be changed into a functional virgin. It was only after many minute inspections of the colony that we detected her presence. When she was removed the bees quickly produced laying workers.

The shortest time taken to induce workers to lay was six days from the removal of the queen. In this case a swarm which was hived on drawn combs had its virgin queen removed as soon as all the bees entered the hive. In another colony a caged virgin was kept in the hive for fifteen days. The next day after her removal eggs were found in the combs. In cases where established colonies were made queenless all queen cells were removed as soon as discovered and daily inspections were made to determine the day on which egg laying started. In such cases the elapsed time from the removal of the fertile queen to the appearance of eggs in the cells was anywhere from ten days in the case of a broodless colony to a maximum of twenty-six days. In 23 or 24 more days the drones began to emerge. Therefore, it was usually five or six weeks after the colony became queenless before drone progeny of the laying workers began to appear.

Apis indica, both hill and plains varieties, differ from the European bee in several aspects dealing with the laying workers. We have on several occasions here at Allahabad found laying workers in the colonies containing brood and queen cells whereas with the European colonies mentioned above the first laying worker eggs were found from five to thirteen days after the last queen

(Continued on page 60)

Let's Have a Box Social

By Mrs. Benj. Nielsen

Tuck some luscious All-Bran Honey Buns in that box that goes forth to the box social.—Photo courtesy Kellogg Co.

You have tried this form of entertainment and that form of entertainment as the various drives for funds have been launched. Have you thought of trying an old-fashioned box social? They can be heaps of fun! Remember? If not, mother will be glad to give you a few tips, I'm sure. Planning, anticipation, suspense—would Mr. Right One know her box on the auction block? He MUST look her way as she assumes an air of nonchalant indifference to hide any give-away sign that the offering now being auctioned is hers. No fair telling or tipping, you know. But how is a gal to prevent a telltale blush, or the winks and grins of those "in the know", I ask you?

'Tis predicted that song fests will return to popularity as a result of gas rationing, and well may the old-fashioned box social return, too. So ere this sees print both may be quite the rage. Somehow we will manage to get to the old school house or church—walk or double up, as folks used to do before we became luxury-spoiled to rolling around everywhere on rubber.

Perhaps you may like the idea of a jitney supper. Not new, to be sure, but lots of fun and a good funds-raiser. A nickle for each serving of what-have-you. Box social or jitney lunch, here's a good chance to cook up and offer a goodly array of honey goodies! If you decide to seat your patrons at tables or just serve from one long table, do carry out a patriotic color and decorating theme. Varying sizes of red and blue stars, obtainable at dime and stationery stores, sprinkled hit-and-miss fashion on a snowy white table are most effective and requires little time or effort. Tall red tapers in frilly blue and white bases make most effective centerpieces for the tables.

If you decide on a box social, do remember that a good auctioneer is important—as important as good advance advertising, heaps of tempting looking boxes, and a big crowd of good-natured bidders. Choose an auctioneer who is not in too big a hurry to get the job done; one who knows the weaknesses and pet likes and dislikes of the folks in the audience; one who can jokingly touch on these foibles and entice folk into and keep them in a bidding frame of mind.

Oh yes, you might make it a costume affair and give a prize for the best costume. Award War Stamps for prizes, of course; War Stamps for this, and as prizes for the winners in any games you may play.

And here are a number of honey recipes to help the cause along.

All-Bran Honey Buns

One-half cup Kellogg's All-Bran, ¾ cup milk, 1½ cups sifted flour, 3 teaspoons baking powder, 1 teaspoon salt, ⅓ cup shortening, 1 tablespoon soft butter, and ½ cup honey.

Soak Kellogg's All-Bran in the milk. Sift the flour, baking powder, and salt together. Cut in the shortening until the mixture is like coarse cornmeal. Add the soaked All-Bran; stir until the dough follows a fork around the bowl. Turn onto a floured board, knead light for a few seconds. Roll the dough into an oblong about ¼ inch thick. Spread with 1 tablespoon of soft butter and ½ cup of honey. Roll up like a jelly roll; cut into 1-inch slices. Place the slices cut side down close together in a greased baking pan. Bake in a hot oven, 400 degrees F., for about 15 minutes.

Honey Pumpkin Pie

One-fourth cup cold water, 1 tablespoon Knox Sparkling Gelatine, 1¼

cups canned pumpkin, ½ cup milk, ½ teaspoon ginger, ½ teaspoon nutmeg, ½ teaspoon cinnamon, ½ teaspoon salt, ¾ cup honey, and 3 eggs.

To the slightly beaten egg yolks add ½ cup of honey, pumpkin, milk, salt, and spices. Cook until thick in double boiler. Meanwhile soften the gelatine in the cold water. Add to the hot pumpkin mixture, mix thoroughly and let cool. When mixture begins to thicken, fold in the stiffly beaten egg whites to which the remaining one-fourth cup of honey has been added gradually. Pour filling into previously baked pie shell or crumb crust. Honey graham crackers and gingersnaps make delicious crusts. Perhaps you may like to use small individual shells which are easy to pack and carry in a box. Chill in a refrigerator or cold place.

All-Bran Honey Orange Bread

Two tablespoons shortening, 1 cup cup honey, 1 egg, 1½ tablespoons grated orange rind, 2½ cups sifted enriched flour, 2½ teaspoons baking powder, ½ teaspoon soda, ½ teaspoon salt, ¾ cup orange juice, and 1 cup Kellogg's All-Bran.

Blend the shortening and the honey; add the egg and orange rind and beat well. Sift the flour; measure, and sift with the baking powder, soda, and salt and add to the first mixture alternately with the orange juice. Add All-Bran. Pour mixture into greased loaf pan and bake in a moderate oven, 325 degrees F., for 1 hour and 10 minutes. Yield: 1 loaf, 5¼x9⅓ inch pan.

Honey Bran Brown Bread

One egg, ⅓ cup sugar, ⅓ cup honey, 1½ cups Kellogg's All-Bran, ⅔ cup cornmeal, ¼ cup melted shortening, 2½ cups sifted enriched flour, 2 teaspoons baking powder, ½ teaspoon soda, ¾ teaspoon salt, and 1½ cups milk.

Beat the egg, add the sugar, and beat again. Add honey and blend thoroughly. Stir in Kellogg's All-Bran, cornmeal, and shortening. Mix well. Sift flour, measure and sift with baking powder, soda, and salt. Add to fruit mixture alternately with the milk. Stir only until flour disappears. Pour batter into greased loaf pan and bake in a moderate oven, 350 degrees F., for 1 hour and 15 minutes. Remove from pan and cool before cutting. Yield: 1 loaf—5¼-x9¼ pan.

Delicious spread with cream cheese blended with honey or honey apricot jam.

Hot Honey Chocolate

Two 1-ounce squares unsweetened chocolate, 1 cup hot water, 3 tablespoons honey, dash of salt, and 3 cups rich milk.

Melt the chocolate (grated) in the hot water. Add the honey and salt. Cook over direct heat for 4 minutes, stirring constantly and being careful not to scorch. Place in double boiler; add the milk gradually and heat thoroughly. Beat with rotary beater just before serving. Serves 6.

Honey French Chocolate (may be refrigerated)

Grate 2½ 1-ounce squares of unsweetened chocolate; add ½ cup of water and cook over low heat until thickened, stirring constantly. Add ½ teaspoon salt and ⅔ to ¾ cup of honey. Cook 5 minutes longer. Then fold in ½ cup of heavy cream, whipped. Store in a jar in the refrigerator. When ready to use, place 1 tablespoon of the mixture in a cup and fill with rich hot milk. Stir well and serve at once.

Honey Cranberry Punch

Blend 3 17-ounce cans of cranberry sauce with 3 cups of honey. Add 2 quarts of boiling water and stir until thoroughly blended. Beat with a rotary beater to remove any lumps. Then add 1 cup of pineapple juice and 1½ cups lemon juice. When ready to serve, place a block of ice or ice cubes in the punch bowl and pour the fruit mixture over, adding carbonated water to taste. Serves 60.

Honey Baked Beans

Two cups dried navy beans, ½ pound salt pork, 1 large onion, sliced, ⅓ to ½ cup honey, 2 teaspoons salt, ¾ teaspoon dry mustard, and 6 tablespoons catsup.

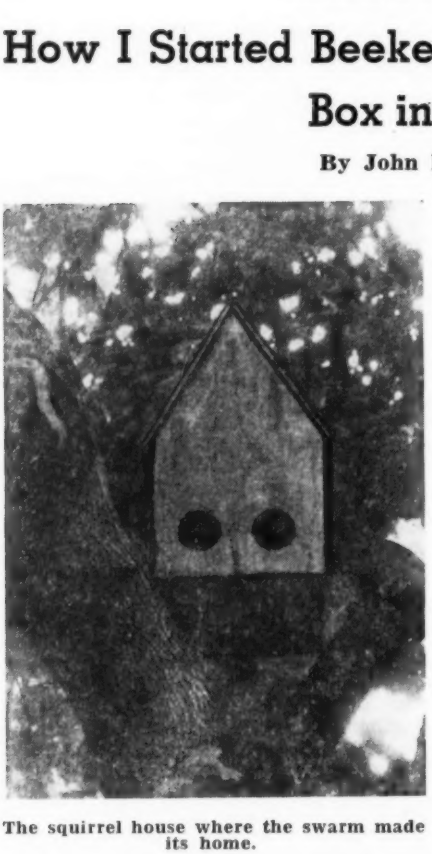
Wash and cook beans in water to cover, cooking slowly until tender. Add more water if needed to keep the beans partly covered with liquid while cooking. Drain off this liquid and save it. Place salt pork in bottom of bean crock. Add beans alternately with the onion slices. Combine remaining ingredients with the bean liquid and mix thoroughly. Pour over beans and onions in crock. Cover and bake in a moderate oven, 350 degrees F., 4 to 6 hours. Remove cover during last hour of baking so top may brown. If beans become dry during the baking process add more water as necessary. Flavors mingle and merge delightfully during this long slow baking.

Aurora, Nebraska.

XUM

How I Started Beekeeping from a Squirrel Box in a Tree

By John B. Seemiller



The squirrel house where the swarm made its home.

In August, 1937, while cutting grass on a very hot Saturday afternoon, I stood under a tree to cool off. While there I heard a commotion as though there were a lot of airplanes overhead. Looking up and seeing none I returned to my lawn mower and, again, I heard this buzzing. I looked up into the tree and where once was my squirrel box there I saw a bee hive (I thought). Calling my wife to come and see this strange phenomenon, she, like a good sport, said, "Why that's a swarm of honeybees. Catch them and put them in a hive and you will have honey". All I said to her was "Yes?" After I got my composure, I replied—"Just leave those bees alone. They don't bother me and I'm not that crazy, yet, to stick my head out to get stung."

That evening we went to a store in Philadelphia and I explained our situation to the sales person in charge of farm and gardening equipment. He related in detail all the things necessary, such as a smoker, bee veil, hive body, comb foundation, frames, cover, bottom board and a book for the beginner. These things were taken

The 22-colony apiary as it looks today.

home and I tried to assemble the hive and frames—there being no instructions, whatsoever, in any package, as to how I should put the frames together.

As per instructions from the sales person, I proceded. I put a ladder up in the tree, put a brace on the ladder to hold the hive and put the hive entrance close to the squirrel box, also put a saucer with sugar water in front of the hive which, according to the sales person, would coax the bees out of the squirrel box into their new home. Alas! this did not work. Upon arriving home in the afternoon I would cautiously steal my way up the ladder to take a peep to see if the bees had gone into their new home. No, instead there were a lot of bees drowned in the sugar water, and that was all.

By this time I really was in earnest about keeping bees and, not knowing any beekeeper in my vicinity, I was in a quandary as to what to do; who would give me information. Finally, I talked to a man who referred me to a member of a local beekeepers' Association. Upon contacting the member of this association he informed me that it was too late in the season to change the bees from the squirrel box to the hive. Just let them alone, he said, and cover them with straw and roof paper for the winter; then in the spring he would stop at my place and show me what to do. In the spring the box was broken and all of the bees were dead.

Beekeeping in Earnest

The following spring I subscribed to a bee journal, and from that I found where to buy bee supplies and package bees.

I started with four packages, buying all supplies from my local bee supply dealer who was instrumental in helping me to get started in the right direction.

I now have 22 hives of bees and I will continue to make increases as time permits. I have started two other people of my vicinity in beekeeping.

People passing by on Sunday in their cars stop and admire how well my apiary is kept, hence more honey sales. A well-kept apiary is an asset to any beekeeper and is also good advertising.

Last year I purchased four reels of moving pictures from the Department of Agriculture, "The Realm of the Honey Bee", to show to the local schools and other organizations. I am still as enthusiastic about bees as in the beginning. Yes, I have been stung any number of times but still love bees and I would feel that something was missing in my life if I were to loose them.

North Hills, Pa.

Attractive and Profitable

This very attractive back-yard apiary belongs to M. F. Stephenson of Argos, Indiana.

The Work of the U. S. Bee Culture for 1941

[We take the following from the report of the Chief of the U. S. Bureau of Entomology and Plant Quarantine.

Of the 120 pages devoted to the Bureau's work, three pages are given to the activities of the U. S. Bee Culture Laboratories under James I. Hambleton. Our readers should know something of this work. We take pleasure in presenting it.—Ed.]

Bee Culture

The maintainance of an active and healthy beekeeping industry is an important defense measure if American agriculture is to function to the fullest extent in the present crisis. The honeybee's importance as an indispensible aid to agriculture through its pollination activities is even greater than its value in honey production. In this respect honeybees can be considered as an agricultural catalyzer, for numerous plants would fail to be perpetuated and many fruit and forage crops could not be grown successfully without bees to fertilize the blossoms. In recent work of the Bureau it was found that during the active season a colony gathered more than 71 pounds of pollen. Such an amount requires the visitation of millions of flowers, and further millions must be visited to produce a crop of honey, for pollen and nectar are usually obtained from different blossoms, and a single blossom seldom secretes more than a mere fraction of a drop of nectar.

In the work on the resistance of honeybees to American foulbrood, carried on cooperatively with the States of Arkansas, Iowa, Texas, Wisconsin, and Wyoming, 232 queens were distributed to agricultural agencies in 34 states. The various lines of stock under test showed less resistance in 1940 than in 1939, and this may have been due to a decreased honey flow. The prospects are bright that the use of resistant strains will help not only to control American foulbrood but eventually to eradicate it.

Inoculation of individual larvae 1 day old or younger with spores of the causative organism of American foulbrood resulted in the infection of about 41 percent of those sealed, but less than 5 percent of those inoculated in the second day of larval life showed infection. Worker bees removed, before time for sealing, about 32 percent of the larvae inoculated on the first day of larval life, 4 percent of those inoculated on the second day, and 3 percent of those inoculated on the third and fourth days. One spore is apparently sufficient to cause infection, although consistent infection of all larvae was not produced even by larger inoculations. Infection depends on the age of the larvae, rather than on the number of spores or on resistance in the larvae, for brood from resistant colonies became infected as readily as that from susceptible colonies. The studies continue to show, even more conclusively than in the past, that resistance to American foulbrood is not a physiological characteristic but a matter of the behavior of the adult bees.

Carmine, starch, and ferric oxide proved unsuitable as traces for determining when honey is first fed to larvae. Stained **Aspergillus** spores were tried, but during the storage of the sirup the number of spores became too greatly reduced. This reduction, however, demonstrates a behavior that may be of vital importance in the transmission of American foulbrood if a similar reduction occurs when the bees ingest disease spores.

Nosema disease may be more responsible than heretofore indicated for loss of queens, poor brood production, and unfavorable wintering. Several queens that had stopped laying were found to be heavily infected with **Nosema apis.** Examination of a number of overwintered colonies showed this organism present in 15 percent of them. The infected colonies survived in poor condition.

Investigations on the heavy losses of adult bees in Utah, conducted in cooperation with the Utah Agricultural Experiment Station, gave little evidence that grasshopper bait is responsible.

Honey bee eggs exposed to sunlight for 5 to 7 minutes were practically all killed, whereas the mortality of larvae 2 to 3 days old exposed to sunlight for 10 minutes was negligible. Exchanging combs of eggs between 2 colonies appeared to have no effect on subsequent brood mortality.

The death rate and food consumption of bees bore no significant relation to the quantity of pollen reserve in two colonies with abundant pollen reserves, two colonies with negligible pollen reserves, and one colony with sugar-sirup stores only.

Recently consumed pollen was found in the midintestine of some bees throughout the winter. Wax scales were dropped to the bottom boards in all colonies wintered outdoors and also by the bees caged more than 2 months; wax is therefore secreted by old bees, even in the absence of comb-building activity. In cage tests begun March 17, and conducted in a constant-temperature room at about 93° F. and 22 percent relative humidity, bees from a colony fed sugar sirup lived 61 and 65 days in duplicate cages, or more than a week longer than the average for bees from colonies wintered with abundant pollen reserves.

Progeny from 15 breeder queens, representing 6 lines of stock, that were tested for honey production showed greater variability among lines of stock than among individuals within a single line. Average yields for the test groups ranged from 83 to 205 pounds, while individual colony yields ranged from 8 to 318 pounds. Differences were also found in the amount of brood produced, the percentage of queens superseded, and the strength of the surviving populations at the close of the active season. Lines of stock showing either high or low performance in 1 season held their same relative position during succeeding years.

Progress is being made in breeding a strain of Italian bees of distinctive color. Since it is difficult to distinguish even between races of the honeybee, lack of strains with well-marked physical characters has been an important deterrent of strain improvement. Because of the ease with which it can be identified, this new strain should prove of value as foundation stock in which to incorporate disease resistance, honey-gathering ability, and other desirable qualities.

Approximately 7 million sperms have been introduced into the spermatheca of a queen bee by artificial insemination, which is about 1 million in excess of the number in naturally mated queens. Since mature drones contain about 10 million sperms, once the technique has been perfected it may be possible through artificial insemination to have queens head colonies for a longer period than when they mate naturally.

Chemical analyses of pollen from 34 species of plants indicate that, in addition to being rich in minerals, pollen also has a valuable vitamin content. The fat content of pollen ranges from about 1 to 14 percent. Pollen shells are hard and resistant to chemical action, and have been found in coal, peat bogs, and ocean slime; they may therefore have characteristics of possible value for plastics or fabrics.

Feeding experiments with pollen added to sugar sirup suggest that there are two phases of pollen feeding. Egg laying is stimulated by pollen in the liquid food supplied the queen by the worker bees, and brood rearing is dependent on the pollen reserve in the form of bee bread. Egg laying, however, seems to be the reaction to pollen eaten, not by the queen, but by the workers, since the stomach of a queen contains few or no pollen grains. Her nitrogenous food is obtained from the worker bee as a secretion, but its gland source remains a mystery.

Correlation of the fat content of pollen with bee activity indicates that the higher egg-laying levels are reached when bees are working plants having pollen high in fat content, such as mustard and dandelion.

Two alfalfa plants, blossoming under artificial light, which had shown a difference of 24 percent in the sugar concentration of their nectars last year, were tested again this year. When the plants were on dry soil the difference in sugar concentration was 17 percent, and when on wet soil 26 percent. The difference in the sugar content of the nectar of these plants thus appears to be a constant characteristic. Such differences between plants have significance from a breeding standpoint if proved to be hereditary.

Hand-collected nectar held at room temperature in the laboratory for a year out of contact with bees was found to have its sugars inverted, while sugar (sucrose) solutions held under the same conditions remained unchanged. It has been commonly supposed that the honeybee brings about a change to reducing sugars by adding invertase to nectar, but apparently this change may take place in nectar that has had no contact with bees. The degree of change, however, varies with the kind of nectar. Thus, orange nectar was found to be high in reducing sugars when first gathered but showed little or no change when held for a year at 20° F. and also at 36°. In contrast to the orange, poinsettia nectar was

(Continued on page 61)

Mr. and Mrs. Melvin T. Pritchard at the time of their 50th wedding anniversary, April 19, 1942.

In Memoriam, Mel Pritchard

By E. R. Root

Our old friend, Melvin T. Pritchard, probably the world's greatest authority on queen-rearing, passed away on Dec. 1. Few men had the intimate knowledge he had from personal observation of all animate life, —animals, birds, insects, worms, and what not. M. A. O., a local Josh Billings, called him a "knowledgy cuss."* This knowledge was not merely from books, for he had very few. He went to the greatest book of all, Nature. His play was digging out the life history of every insect that he could find. Scientific men who came to Medina from all over the country, and the world, in fact, expressed their pleasure in meeting Mr. Pritchard. After some little conversation, they one and all were surprised at the depth of his knowledge concerning many subjects on which they, themselves, were supposed to be authorities. When it came to bees and beekeeping Mel was the man who perfected the Doolittle system of queen-rearing, a system that came to be almost universal throughout all beedom where queens were reared by specialists. It is not too much to say that millions and millions of queens were reared under the Doolittle-Pritchard system.

Dr. F. W. L. Sladen, an entomologist of Great Britain, likewise a queen breeder himself (for the pleasure of it), said after interviewing Mr. Pritchard, "He is one of the most remarkable men I ever knew". A year or so later when Sladen's book "The Humble Bee" came out in 1912 I gave Mel a copy. He pored over it for two or three weeks. When I went down to see him he remarked almost immediately, "That man Sladen knows what he is talking about." "So many scientists", he continued, "don't thoroughly know the thing they are writing about, and according to what I see in the air and in the ground, they make mistakes."

Mel served five generations of the Roots. He first began to work for Homer H. Root, A. I. Root's father,

* He characterized Mr. Pritchard as a "knowledgy cuss" and as a "skunkologist". Referring to him further he said, "He knows more about queen bees, bugs in general and all outdoors than most any feller I know of. I call him Philosopher when he lets me get near enough to him to call him anything. I am about as satisfying and congenial to him as a red rag is to a bull."*****Notwithstanding this I still say Mel Pritchard knows a lot of things and looks like a owl".

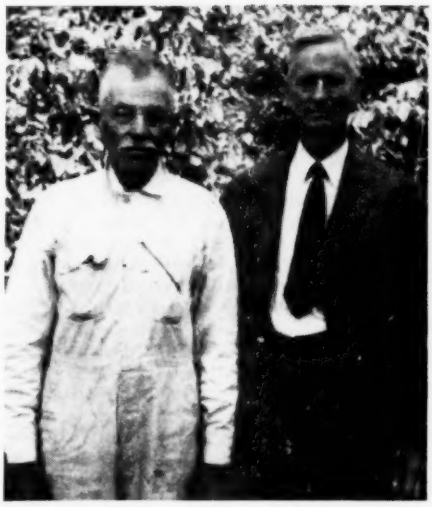
as a chore boy. Later he worked for A. I. Root in his gardens at the munificent sum of 6c an hour. That was when the silver dollar was worth even more than one hundred cents in purchasing value. Later he began to rear queens.

I very frequently consulted Mr. Pritchard on the question of bee behavior and when scientists disagreed, I let Mel decide who was right. As time went on it became more and more apparent that Mel was correct.

Mel was also a believer in the new orthodoxy of wintering—plenty of pollen and honey, a large cluster of young bees, and upper entrances.

He was seventy-six years old when he passed away. He was our queen-breeder for 42 years, during which time he himself reared around 150-000 queens.

Having retired within the past year, he found that the old body and his eyes would not respond like they did in the younger days. On his last visit to our office (every member of whom knew and respected him), he called to see his old friends. With a halting step he walked through some of the departments, shook hands with the people who not only admired his ability but loved him. As he stepped out of the door, he said, "This is the last time, Ernie, that I'll see my old friends." With cane in hand, he walked over to the car that was waiting for him. As he stepped into the machine, he said, "My children think that Grandpa ought not to drive any more, and I guess they are right."

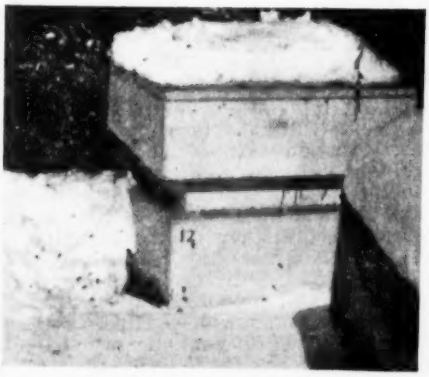


Mr. Pritchard and Mr. W. D. Achord, both veteran queen breeders.

A few days later he was taken sick and passed away.

The picture of Mr. and Mrs. Pritchard was taken on the occasion of their 50th wedding anniversary, celebrated on April 19, 1942, at their home.

Our Cover Picture



The apiary on the cover is one operated by Bro. Pancratius, St. Mary's College, North East, Pa. The picture was taken March 4, 1942.

In the same apiary is this strong colony in a double-walled hive. Notice the heat from the entrance had melted the snow away enough to expose the front of the hive. In the warm sun of the afternoon the bees from this hive were flying.

XUM

From the Field of Experience

SWARM ON BATTLE FRONT PRODUCES HONEY FOR SOLDIERS

By T. Brotherwood

During the last great war, in 1915, I caught a swarm of bees on the Somme in France. There did not seem to be a bee for 40 miles behind us for the Germans had been all over that country and cleaned them up.

Subsequently I found out that they had gathered all the bees they came across in France and taken them to Germany.

If you remember, one item of the peace treaty was that they had to give France, as a first installment, 10,000 hives of bees. I don't know how many more they had to return, but it shows how important bees are, even in Europe.

I obtained an empty box and hived those bees. They were hanging on a low bush, hungry and cross. A little cigarette smoke helped.

We were camped in a chalk pit and I put the bees where I thought a stray German shell would not hit them.

For many hours I sat and watched those bees work. When I hived them I saw only one drone.

The clover was in bloom, and I had those bees for five weeks. Then we got word that the Germans were advancing and we would have to get out so I drove the bees from the box and cut out about 15 or 20 pounds of honey. My comrades and I had a good feed.

By the way, the queen had just started to lay eggs, so she must have been a virgin. Did she mate with that single drone, or was she a drone layer? I could not tell by the eggs, but they looked even enough.

The caterer sergeant happened to come along and asked if he could have some honey to take to the General's mess. His quarters were in the chalk pit also. So after dinner out came the General, and five or six of his staff, and said that the honey was the best treat he had had for a long time.

I had to show him the bees and tell him all about them. And to think that my little box of bees, gave that General a little relaxation from his worries and anxieties for a few minutes also gave me pleasure.

Well, I put the bees back in their box, and the next morning we had to get out.

I have often wondered since about the ultimate fate of those bees. Did some German find them and in his fury and disappointment when he found they had no honey ruthlessly destroy them, or did some German bee lover find them to give him some pleasure and relaxation, as they had given me?

Columbus, Ontario.

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BEES ON A RAMPAGE

By C. O. A. Kramer

One of my friends decided that he wanted to raise bees. He has ample ground space at the edge of town in one of Chicago's popular suburbs so he purchased a complete hive with frames, foundation, stand and cover and placed it under an apple tree facing the open fields. Also he had in reserve his Boardman feeder with 2-quart Mason jar.

When his package of bees arrived from the South he had full instructions how to care for them and hive them, all of which he did without trouble. He mixed his sugar and warm water in the proper proportions, placed the Mason jar in the feeder, and for two or three days all went well.

But, being of a thrifty turn of mind, when the feeder was nearly empty, he thought of a large jar of pears packed in simple syrup last fall, which the family was going to have for dessert that same evening. What could be simpler than to use the simple syrup all ready at hand? The pears were ladled out in separate dishes and the simple syrup placed in the Mason jar on the Boardman feeder.

In about half an hour he was glad that he had only one hive, because it seemed that every one of those bees rushed out of the hive and evidently began searching for pear nectar. They searched all the trees, the bushes, and even the blades of grass on the lawn. This lasted until sunset, when they reluctantly returned to the hive. Sensing that this unusual uproar was probably caused by the simple syrup in which the pears were packed, my friend quietly removed the offending Ma-

son jar, removed the pear juice and refilled it with plain simple syrup.

Next morning all was quite and serene again. The usual number of bees went about their appointed tasks and there was no repetition of the rampage of the evening before. The moral seems to be: **Don't feed your bees fruit juices.**

River Forest, Illinois

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"I'LL NEVER DO THIS AGAIN"

By Emory Ward

Certainly there is nothing in the world for the beekeeper to be ashamed of when he makes a mistake or an error in judgment for the first time. The trouble comes not in making the mistake **originally,** but in **repeating** it. If we continue to make the same error over and over again, then certainly we have no excuse whatsoever for our shortcomings.

As I mention this, I blush to think of a fatal mistake I made twice in rapid succession a short time ago—the mistake of not knowing enough about merits of my product. Eventually, after the second lost sale, I got wise to the mistake and corrected it. I swear I won't let that mistake happen again!

The trouble started one afternoon while I was waiting on a prospective customer at my roadside honey stand.

Just as the customer was ready to buy a jar of honey, a sudden question popped into her head. "What about calories?" she asked. "How many calories are there in your honey?"

The question caught me completely off my balance. Frankly, I didn't know, but I stammered around incoherently for several seconds trying vainly to phrase a satisfactory answer without displaying my ignorance about the subject. For years I had been vitally interested in honey —raising it and selling it— and here, all of a sudden, a lady's question made me realize how little I actually knew about the product I was trying to sell.

"Calories?" I repeated blankly. "Why . . . why really I don't know about calories. But I guess . . ."

My show of ignorance cost me that sale. "I'm sorry," the customer declared, as she put down the honey and turned to go, "but I really must watch my calories. I guess I better forget about honey today."

I should have learned my lesson from that mistake—but I didn't! Several weeks later a similar occurrence cost me another sale. "Is honey fattening?" this particular customer asked.

Again I was stumped. I didn't **think** honey was fattening, but I wasn't sure. My uncertain mumbling was worse than a definite "yes" or "no" and as a result, the customer walked off. I didn't know my merchandise and the sale was lost.

That was enough. I swore then and there that I'd never make **that** mistake again.

Right away I started out to really learn something about the product I was trying to sell. I realized suddenly how imbecilic it really was to try to sell a product without an adequate knowledge of that product's actual merits. Immediately I set out to discover something about honey's nutritional properties—its place in the diet, and its use medicinally.

From the bee journals, from general magazines, and encyclopedias I gathered enough information about the virtues of honey to enable me to talk intelligently and knowingly about my product.

Frankly, the time spent in learning all the health benefits of honey was some of the most profitable time I've ever spent. As a result, sales come far easier now, for as any successful salesman will tell you, one of the first rules of effective salesmanship is "Know your product". Today since I'm aware of the many benefits that honey possesses, it's easier to sell other people because I'm sold **myself!**

It seems a shame that with such a grand story—with all the special merits and benefits and advantages that honey possesses, that every beekeeper doesn't take just a few moments to really learn about his product—to learn just a few of its many advantages so he can pass the wonderful story of honey on to all his customers.

It's good business—and it's a service to your customers.

New York, N. Y.

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MORE AND BETTER SWEET CLOVER

By Penn G. Snyder

After a search covering over 25 years for the best soil-builder and leguminous forage plant for stock, the United States government experts have fallen back on the lowly sweet clover. So again this outcast is being used as the keystone of agricultural husbandry.

XUM

It has been found that sweet clover will produce results no other crop will give in most of the soils of the United States. It has been shown repeatedly that planted on soils yielding around 45 bushels of corn to the acre, after one year of sweet clover the corn yield jumps to 75 or more bushels. No other crop will produce such results, and no one knows the reason why sweet clover gives those beneficent results for mankind.

There are many strains of sweet clover and it is probable after further scientific selection and breeding that this wonder plant of our farms will be planted from the Arctic Circle to the Gulf of Mexico. As a conserver of soil fertility it has no equal.

The Dominion of Canada has developed several very fine strains suitable to the northland among which is the well known and deservedly famous Pioneer strain.

Our Department of Agriculture, Washington, D. C., with several states cooperating is conducting a large scale search for the best strains suitable to United States conditions. At Lincoln, Nebraska, there are planted some 10,000 sweet clover plants which have been gathered from every country in the world where sweet clover is known to grow.

It is well known sweet clover has a bitter taste which stock, as a rule, do not care for. This is caused by the substance coumarin, which is found in the plant.

In most forms of vegetation there is a wide variation in any one class, and sweet clover is no exception to this rule. From the plants so far tested at Lincoln it has been found that the amount of bitter tasting coumarin varies from six-tenths of one per cent to three per cent. It is very possible that a strain may be developed entirely free from this objectionable substance. The Canadian Pioneer strain has but two-tenths of one per cent. It is so far the best strain discovered in this respect. However it is not very well suited to the soils of the United States. It is primarily a northern strain.

I am advised this work on sweet clover could be speeded up if sufficient pressure could be brought to bear on the Department of Agriculture in Washington. It would be an advantage if we could receive the backing of farm publications, grange, and farmers organizations, as well as all beekeeping organizations and beekeepers. There is little doubt it would be of inestimable value to the farmers over the United States, to say nothing of we beekeepers.

It is well known sweet clover is not being planted in many sections, where, a few years ago it could be seen on most farms. With improved strains, sweet clover could stage a nation-wide comeback. This would have a great stabilizing effect on the production of honey. Why not sit down NOW and draft a letter to the United States Department of Agriculture, Washington, D. C., and request that the work being done by Dr. E. A. Hallowell, Bureau of Plant Industry, be speeded up as a war measure? This would be the cheapest insurance we beekeepers could take out—**more and better sweet clover.**

Trotwood, Ohio.

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FOUR FINE HONEY-FED YOUNGSTERS

By John Burghardt

Our four youngest children have been fed honey instead of sugar, Eugene, 6 years; John, 5; Joan, 3; and Carolyn, 2. We removed the

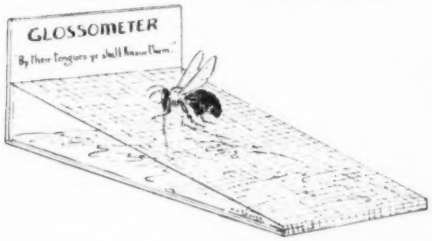
sugar bowl from the table long ago and use extracted honey in its place and find it much more healthful. We also use much honey in canning fruits and making preserves. The writer has been a steady reader of the bee journals for over 25 years and owns hundreds of hives of bees in Central Iowa.

Jewell, Iowa.

GLOSSOMETER

By William Smukler

A glossometer has been used a number of times to measure tongue-length of bees. Dr. E. F. Phillips says that the instrument has practically no merit; the reliability of the



glossometer is doubtful. Bees which succeed in reaching the honey farther in on the glass do not necessarily have the longest tongues; actually, the instrument measures how far the bees reach with their tongues and not how long their tongues are. Then too, the accuracy of the instrument is questionable, for the gauge marked off to measure the bees' tongues is not a precision instrument.

Ithaca, N. Y.

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PLATE GLASS USED IN IMBEDDING FOUR WIRES AT A TIME

By Bro. Andrew

By my plan I imbed four wires in a full sheet of foundation of a standard frame in about two seconds and all in a single operation. I use electricity from a 16-volt transformer on a 110 volt AC current. It would be still better to have a transformer in which the voltage could be varied from 8 to 24.

Provide a board about ⅞" thick and of such a size that it will fit inside a standard frame. Also cut a piece of plate glass $\frac{3}{16}$" thick the same size.

Place the wired frame containing a full sheet of comb foundation down on the board with the wires uppermost. Lay the piece of plate glass on top of the wires.

On the end of each wire from the transformer, solder a heavy nail for a terminal. With one in each hand, make contact with the nails in the end bar to which the ends of the frame wire are attached. The progress of the imbedding can be watched through the glass as the wires heat. If you do not succeed the first or second time, keep on, for with a little practice you can imbed four wires rapidly.

For imbedding two wires in shallow frames, the voltage should be cut to 8.

St. Francis Xavier Mission House
Island Creek, Massachusetts.

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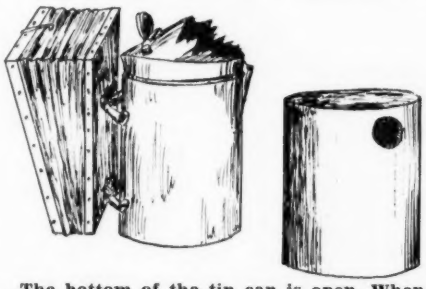
MAKING THE OLD SMOKER DO

By Arnt Arneson

After three years service, the top of my smoker was entirely burned out. I hit upon an idea. I hunted un-



The bottom of the tin can is open. When set into the old smoker it worked just like a new one.

til I found an empty can that fit—and presto—all I had to do was to punch a ¾ in. hole near the closed end, and now my smoker is good as new.

Rice Lake, Wisc.

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SECOND GLANCES

By C. M. Isaacson

Considerable progress seems to have been made in the development of AFB resistant stock (page 713) but the caution against confusing resistancy with immunity is all the more timely. The whole situation might be summed up in a few words—in the hands of a competent and careful apiarist, resistant strains can be of considerable value; but with a careless beekeeper, or one of the "let-alone" type, almost a menace. Just as an afterthought to Mr. Lyle's experience with resistant stock, might not a part of the favorable results reported come from better methods developed over the period in question? Were diseased colonies **burned** as found or were they simply **requeened?**

And from the items quoted by Editor Root, one point stands out, that no larvae have been found **immune** to AFB; it is only colony behavior that determines the degree of resistance (page 716).

Anything from Rev. Langstroth's writings is always of absorbing interest (page 717). He had the "seeking touch" of the true experimenter. The persistence and ingenuity shown in the article plainly demonstrates why he succeeeded in so many cases, even if not in this particular one. But as to his rearing of queens in March or April, would not that have been too early in the season, even for Ohio? His mention of "large Stocks" for wintering is also interesting in view of present-day admonitions.

There is a lesson for all of us in Mrs. Neilsen's advice to pause for at least a day or two this Christmas season, just for a chance to relax and reflect a bit perhaps (page 720). And a bit of something extra in the way of food will do its part. But (I hate to put in "buts") would it be at all possible to reduce the proportion of sugar in the honey fudge recipe, Mrs. Neilsen? Some may find their sugar jars (I almost said "bins") too low to use the recipe these days.

The excitement of sugar rationing did make people think about honey; we will be neglecting a real chance if we fail to **keep** them thinking (page 724). Mr. Day brings out some worthwhile points, the suggestion of "sweet Saturdays" sounds both a bit on the unusual side (an advantage) and good.

The advice is old but always can bear repetition—to make sure an abundance of honey is left for the bees when the season is over (page 726). As to management to insure this, placing the second brood chamber above an excluder shortly after the beginning of the main flow is the safest method. Unless the flow is unusually long, production will not suffer from any slightly smaller amount of brood raised.

I think it is somewhat difficult to secure purely bred queens of the darker races, which may help to explain the predominance of the so-called mismating reported by Wayne Keller in his Carniolan experiment. Then, too, there has been considerable evidence of late to show that the drone is not always the product of parthenogenesis. That aphids are sometimes parthenogenetic and at other times bi-parented is well known, perhaps something of the sort may be true of the drone honeybee.

Just an added thought to S. H. Burton's bit of ideology on the communal organization of the honeybee. A true republic is most often defined as a state where the best fitted govern with common consent—is not this precisely the case in the honeybee colony? Of course, comparisons of this sort are dangerous and depend too much on definition. And anent the "corn tassel honey", does corn secrete nectar or was it honeydew from aphids on the corn?

The editorial on page 734 gives figures quite effectively answering those who wish to keep beekeeping a "closed shop". Waste can help no one, and we are wasting enormous quantities of honey and wax—to say nothing of lost pollination—by having too few bees. There is a lot of "meat" in those few paragraphs—keep them in mind.

Just to stop a bit with Mr. Burton again (page 745), why mutilate hive bodies to provide an upper entrance? Use a strip of shingle at one corner between the two hive bodies (or under the inner cover if wanted on top), and you have your entrance easily and simply. It works on thousands of colonies in this locality.

Will your name appear on the "who's who" of the American Honey Institute? Not for the sake of seeing our name in print, but because it will show that we are awake to the need for keeping honey before the public—give whatever you can—soon.

Middle River, Minnesota.

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"Pore old Bill—he's been trying for six months to get a new metal cover for that hive."

Editorials

The Selective Service System, on December 5, released a definition of essential farm products to help the Local Draft Boards determine what workers are essential to agriculture. Eight classifications of essential products were named and three classifications of non-essential products. Work is now in progress in Washington to include beekeeping in the essential occupations. It is hoped that 25 colonies of bees will be given the same weight as one milk cow in computing the credit for essential farming activity.

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Looking Ahead Under present chaotic world conditions we naturally wonder what the future holds for mankind, and, incidentally, for our beekeeping industry. No one knows.

Those who worry, perhaps unduly, about the present situation may develop a fatalistic philosophy of life which tends to dampen enthusiasm and deaden the very fiber of life.

It seems reasonable to believe that after tyranny has been put down, **right will eventually prevail.** If we possess enough optimism to believe this, we will have a more hopeful outlook on life.

Our country is at war and not until this war is won can we live in security and enjoy the freedom which is ours. All of us must sacrifice to help win this war.

As beekeepers we are willing to do everything possible to bring an early victory. This year of 1943 may be the year of extreme sacrifice and for some beekeepers who have left their bees to enter military service it may mean the **supreme sacrifice.** We who are left at home must bend every effort to help carry on.

The beekeeping industry, a vital branch of agriculture, so essential to the perpetuity of life, must go on. There are better days ahead.

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Use of Chemical Nitrogen in Fertilizers on Farms Curtailed A release from the Office of War Information of War Production Board dated December 4, 1942, states that, "A grade substitution program expected to reduce the consumption of chemical nitrogen in mixed fertilizers by approximately 20 per cent was instituted today by the Director General for Operations through issuance of General Preference Order M-231 as amended. Through this program a large amount of nitrogen, vital for war purposes, will be saved without imparing crop production in more than a negligible degree".

This action makes it all the more necessary that legumes be produced in larger quantity, enabling each farm to produce its own fertilizers.

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Normal Movement of Package Bee Shipments Appears Likely The following letter from Harold J. Clay of Marketing Programs Division, Washington, D. C., to W. E. Anderson, Baton Rouge, La., comes as a relief to those who have been concerned about the shipment of packages this coming season:

In view of the shortage of railway equipment, some concern has been expressed lest there be difficulty in securing sufficient express cars for shipping package bees next spring. The matter was taken up by our transportation people with the ODT, and the following letter, dated about December 2, has been received from Mr. John W. Barriger, III. Associate Director, Division of Railway Transport, Office of Defense Transportation:

"We do not anticipate that any difficulty will be experienced in the handling of perishable traffic (including honeybees) by the Railway Express Agency. However, should any specific problems arise, if you will please communicate with this office prompt attention will be given to meeting any local necessities that are reported to us.

"No rationing of service or equipment is now under consideration, but should it be necessary to impose such restrictions later, traffic of the character in which you are interested would be fully protected."

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Populous Colonies with Ample Stores Essential for Successful Wintering Years ago some beekeepers used to think that two or three pounds of bees for each colony, late in the fall, was sufficient to insure good wintering. Those who hold such ideas today will have to revise them, or continue to have winter losses. A colony during early October in this region should have from 6 to 8 pounds of bees.

The main advantage of a double-story brood chamber is that it provides adequate comb space for brood-rearing in the fall, also for the storage of an ample amount of honey and pollen for winter and early spring stores. Furthermore, the two-

story brood chamber permits the bees to form the center of the cluster between the two sets of combs, thus enabling the bees to move sidewise, or laterally between combs if necessary. The single-story colony has no means for bees to pass back and forth between combs, except at the very top of the hive, or underneath the bottom-bars. Langstroth saw this and recommended cutting holes in the center of the combs late in the fall to permit the single-story cluster to move sidewise during the winter months.

While it may be possible in some instances to winter colonies of subnormal strength, it rarely if ever, pays to do so. One very populous colony in the spring is worth more than half a dozen weaklings. In order to produce these populous colonies it is quite necessary to provide ample comb space and to leave a superabundance of honey and pollen with each colony. Such colonies are likely to survive severe winters even though they have only a moderate amount of protection.

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Increased Sugar for Bees Permitted by O P A After the December, 1942, issue was on the press we received a government release stating that Amendment No. 26 to Ration Order No. 3, Sugar Rationing Regulations, effective Dec. 2, permits beekeepers who have exhausted their 1942 provisional allowances of sugar to draw upon their 1943 and 1944 allowances to the extent of 15 pounds per colony for winter feeding. This action was taken because the fall flow of honey was below expectations.

Even though the season in the North is rather late for feeding sugar syrup, it seems possible that in some regions where mild weather prevails, it may be possible to save bees short on natural stores by feeding syrup. Every effort should be made to save bees, because they are likely to be needed more than ever before this coming season.

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Saving of Winter Stores not Necessarily a Desirable Desideratum Years ago it was generally admitted that for cold climates, cellar wintering, as compared with outdoor wintering in the same locality and with the same colony strength, would save a considerable amount of stores. However, it has been noted that, as a rule, bees wintered out of doors with adequate protection are in much better shape and stronger for the honey flow than are bees wintered in a cellar. The recent trend has been toward outdoor wintering, although quite a number of beekeepers in the North continue to winter in cellars.

If packing, heavy or moderate, saves some stores, the loss of stores due to no packing may be converted into brood and bees provided the colony is strong and there is sufficient honey and pollen. Obviously, the vitality of the bees in an unpacked colony is reduced somewhat, but to what extent we can not say.

Our own experiments at Medina show that while the packed colonies saved stores over the unpacked colonies, the unpacked had proportionately more brood in the spring, and, of course, that means more young bees. See page 331 of the June, 1942, Gleanings.

In placing our evaluation upon heavy, light, or no packing we should measure the winter performance not on how many stores are saved during winter but what the colony actually earns through the entire year, or, better, a period or series of years. It has been proven over and over again that packing will save some stores between fall and spring. But we have been forgetting that that saving of stores may mean less brood and less young bees in the spring.

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Excess Moisture, a Foe of Wintering In the old days we thought we knew how to winter bees. We now realize that the problem of excess moisture in hives was not solved. We used cushions above the clusters to absorb moisture. We did not, at that time, realize how much damage moisture was doing. We perhaps succeeded in getting some of the moisture out of the brood chamber into the packing above but this packing material froze and was then worse than no packing.

We now know that excess moisture within the hive during the winter is the main cause of dysentery. We used to think pollen in the intestinal tract, not completely digested, was the cause of dysentery. It may have been a contributing factor but not the main cause.

Many beekeepers who have adopted the upper or top entrance find that it allows excess moisture to escape, leaving the cluster of bees dry. The other factor in favor of the upper

entrance, is that it prevents the colony from suffocating in case the lower entrance becomes clogged with dead bees or ice. In other words, the upper entrance is not only a means for the escape of excess moisture but it is insurance against suffocation of colonies during winter months.

Don't forget that Langstroth, many years ago, experienced much difficulty with excess moisture within the hives during winter months and that he was one of the first to advocate upper or top entrances to help expell this excess moisture.

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"Nothing New Under the Sun" Several times in late years we have called attention to the fact that many new ideas or practices that have come to the front are really old ideas advocated by some of the pioneers in early beekeeping. We refer particularly to Langstroth, Quinby, Dzierzon, and others.

In our last issue we showed that the upper entrance was exploited by Langstroth and recommended by him. The fact that anything is old does not necessarily mean that it is useless. Perhaps most of the old ideas have been superseded by something better.

The older European writers discovered that there were two distinct foulbrood diseases. One they called "curable," and the other a "malignant" type. Among the early writers was Dr. Dzierzon, author of the Dzierzon theory and inventor of the Dzierzon hive. Before us we have "Dzierzon's Rational Beekeeping". On page 273 we find an accurate description of the two forms of disease —one that we now recognize as European, which he calls curable, and the other the malignant kind, which we call American. On this same page (published in 1882) we find this:

Foul Brood Is of Two Kinds

There is one kind that is mild and curable, and another kind malignant and incurable; both kinds are, however, contagious.

The curable occurs in this way: more of the larvae die still unsealed, while they are still curled up in the bottom of the cell, rotting and drying up to a grey crust that may be removed with tolerable ease. The brood which does not die before sealing mostly attains to perfection, and it is only exceptionally that individual foul-brood cells are met with sealed.

This is exactly reversed in the malignant kind of foulbrood. In this, the larvae do not generally die before they have raised themselves from the bottom of the cell, have been sealed and begun to change into nymphs. The rotten matter is therefore not found on the cell floor, but on the lower cell wall; it is brownish and tough and dries up to a firm black crust, both in consequence of the heat prevailing in the hive and of a small opening bitten in the depressed cover. This matter the bees are not able to remove; and when they are in some strength, they can at most get rid of it by entirely biting down the tainted cells and making fresh ones.

The early German edition was published almost twenty years before this. Whether this description was in the first edition we are not able to say. Although the mild form was written up in Europe, the writer recalls that we in America were slow to recognize that there was a difference and that one form would disappear itself if the colony was strong and honey was coming in; the other form would continue to be malignant under all conditions.

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The Vegetative, Rod and Spore Stage of American Foulbrood These have not been understood by the average beekeeper, especially in connection with the review of the bulletin entitled, "The Mechanism of Colony Resistance to AFB" as given in our last issue. We wrote A. W. Woodrow, author of the above named bulletin, asking him to define these stages. In a letter of November 7, he writes:

The "rod" stage and the "vegetative" stage of Bacillus larvae are two names for the same thing, as you have concluded. On germination of the spores in the honeybee larvae, and on artificial media as well, the organism enters the vegetative or multiplication stage, in which the organism in the form of minute rods multiply to enormous numbers in the infected larvae. These rods generally grow in chains. Sometimes chains of 40 or more rods may be found. Under some circumstances, other forms may be assumed by the bacteria. In this "rod" stage the organism cannot cause a new infection. However, after the disease has developed in the larvae for some time, often 12 days after hatching, the spore stage may be found. It is not known just what causes this change from rod to spore stage but it occurs after the larvae has, in a sense, been consumed by the developing rods. This stage, which might be likened to a ripened seed stage, is highly infective for honeybee larvae.

There is no spore stage in EFB (European foulbrood) and that is the reason it is relatively easy to cure. But AFB unfortunately has the spore stage and it is that stage which makes the treatment of this disease so difficult to handle. The fact that these spores can be boiled for five hours and in many cases retain their vitality, and the fact that they can live for years in a healthy condition, shows plainly why the mere shaking onto frames of foundation is inadequate. This has been stated in our columns before but will bear repeating.

XUM

From North, East, West and South

NORTHERN CALIFORNIA, Dec. 4

Weather: The fact of covering so much territory as we do in California often causes us to wonder if our report of weather is a fair one for the student of weather conditions affecting bees in their production of a honey crop. Today we received a report from the center of the star thistle district some 150 miles from Oakland. In this report the reporter says, "We have already had a heavy rainfall for so early in the season and this usually guarantees a good crop for the coming year". Another reporter who is a student of the effect of weather on the season's production of honey, located only 10 miles from the first reporter writes, "The prospect for next year's honey crop is not good. So far we have had little rain, and we depend on good early as well as late rains for a good crop of star thistle honey. We must have good rains for the roots to get a good start". This seems a fair sample of guessing on next year's crop. When the first reporter was told the condition of rainfall was so different in such a short distance he replied, "So many things affect the weather in California we cannot depend on weather alone for a crop."

Condition of Bees: Much depends on the condition of bees at this time for what we may expect from them in 1943. There is marked improvement along this line in California. Each year shows greater care in the selection of queens and for the quality of honey that is left to carry them over the winter. That usually guarantees good wintering and a satisfactory build-up in the spring.

Market: There are few complaints from producers or dealers. While most of the honey is out of the hands of the producers, dealers seem to be well supplied.

Beeswax: There has been so much said about the demand from the Army for beeswax that every beekeeper is determined that the demand shall be filled and are more careful about saving every scrap which in the past has been wasted.

Miscellaneous: War conditions and shortages have made it difficult for the Board of Managers of our State Association to decide whether on not it was wise to hold a convention this year. They decided in favor of a Victory Conference instead of the regular convention and named the place for holding a two days' meeting at Pomona, the dates to be December 4 and 5. After this a series of county meetings. At the Victory Conference E. L. Sechrist will lead the discussion of a very important subject:—"The Beekeeping Industry in Relation to the War Effort." The balance of the program is well balanced and in good hands. Organization and a plan to take care of the bees of beekeepers who are in the Army or will be soon. This alone deserves the serious attention of every beekeeper in California.—Cary W. Hartman, Oakland, Calif.

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SOUTHERN CALIFORNIA, Dec. 2

Weather: Sunny Southern California certainly has lived up to its name during the summer and fall months of 1942. Scarcely enough rain fell to lay the dust over most of the country since early spring. But there is plenty of time for rains to assure us a crop in 1943. Fogs along and near the coast helped blossoms in that area to furnish some nectar. Nights are getting quite cool but the days are balmy and even quite warm at times. Farmers were able to harvest their crops and get them under cover with practically no loss from the weather.

Market: Honey prices so far as we can learn are about the same as at our last writing. In fact, there are very few lots of honey left in the hands of producers. So many beekeepers sold early last year thereby loosing several cents per pound compared with the fellow who was fortunate enough to hold until February that a few are still holding and hoping for a little more for their honey.

Beeswax is in good demand at well up to ceiling prices so we understand.

Miscellaneous: If there has been any appreciable effort put forth to

increase the number of colonies in Southern California, we have not learned of such. In most sections 1942 was not favorable for making increase. Many colonies are very light in stores with the probability of loss unless feeding is resorted to. Beekeepers are fortunate in being able to get sugar for feeding and should grasp the opportunity, for "the empty hive will not produce any honey during 1943."

There have been quite extensive plantings of avocados in few sections of Southern California. These evergreen trees bloom profusely in mid-winter. Some beekeepers are intending to move bees to try for nectar from that source. We will not venture a guess as to the success or otherwise from that source as we have no information as to their value as nectar producers. But beekeepers are persistant and will try anything once. With our modern methods it is only a night's work to move a hundred colonies of bees a hundred miles and have them ready for work on the new location in the morning.

Forest fires burned over several thousands of acres in our county since our last letter. Some of this was bee pasture but most of it was heavy brush and of little value except as a water-shed to retain the moisture after the rains. Considering the long dry summer we are most fortunate in that we have not had more devastating forest fires in the honey-producing parts of the southland.—L. L. Andrews, Corona, Calif.

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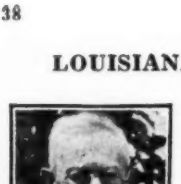
TEXAS, Dec. 1

Weather: November was a month normal for weather, plant growth, and bee behavior. A gradually lowering temperature, clear skies, with an occasional rain, allowed fall blooming plants to supply the bees with small amounts of pollen and nectar up to the very last day. While the bees worked on approximately two-thirds of the days, the scale hive shows that the amount of material carried in did not offset the amount used during the month. The average loss per hive of the fifty colonies was seven and three-fourths pounds which is low as compared with a twenty-year average, the explanation being that while much brood was still being reared this month the amount of material stored was also great. On the last day of the month a number of plants in bloom which produce both nectar and pollen was large; however the bees pay little attention to these except where the plants are located in well protected areas, as the average temperature is too near the clustering point. Many of the plants cultivated for ornament in Texas and which have their origin farther south have their blooming period near the end of the year. These plants, Poinsettias, **Malvaviscus grandiflorus,** and the like are making a vivid picture out of the San Antonio streets. On opportune days bees will be found working very actively on Turk's Cap (**Malvaviscus grandiflorus**). The bees however do not seem to be collecting pollen but sap which collects along the broken edges of its brilliant red petals. It does show one thing, that bees do not mind low temperatures when they are in need of food.

Conditions: Beekeepers contacted during the month are preparing their colonies so that the production next year will be the largest which the bees are able to gather as the beekeepers are already doing their part in the preparing of hives and other material necessary for a bumper crop. The weather, too has been agreeable to honey plants. Horsemint is showing in great abundance. Some of it on the Gulf Coast is three or four inches high. Inland the rosettes are sufficiently large for determination. Guajillo, guayacan and other honey bearing shrubs have made an abundant vegetative growth and with a normal season next spring should give a normal flow. Many of the beekeepers who have a considerable number of colonies and are well versed in the art of commercial bee work are buying every available colony. This is a move which will insure a better honey production next year. A majority of beekeepers with only a few colonies seldom make a sufficient amount of honey to put on the market. The commercial beekeeper with the same colonies and same equipment with his ability to manage a large number of colonies will be able to take these same colonies and have them produce abundantly. As this writer has said before, **in beekeeping the greatest assets are knowledge and experience.**—H. B. Parks, San Antonio, Texas.

LOUISIANA, December 1



Weather: Conditions have been ideal all through the fall flow, and goldenrod and asters were given a real chance to produce a surplus. Up to this date December 1, we have had no freeze and just enough frosty weather to "dry up" the flow. Bees are still busy gathering pollen and this assures us of a liberal spring supply for early brood-rearing. Honey plants appear to be in fine condition and white Dutch clover is beginning to cover the ground.

Market: The confusion is almost indescribable. Heavy local demand and many outside inquiries find producer stocks exhausted. Little packers are about "out of business" until the new crop comes along; bulk honey, where any can be found, is priced higher than the producer-packer can get after cleaning and bottling and the recent action of the price administration in raising the ceiling price, as stated in a press release through the A. P. from Washington, quote,—"for the avowed purpose of putting honey back on retail store shelves," comes too late to help more than a few large handlers, as the little fellows—like me—are already ruined.

Miscellaneous: The recent articles on wintering were of great value insofar as they impress us south Louisianians that we occupy ideal territory. We are reputed to be "very lazy" but we really just let our "working partner—nature" do most of those things which you find necessary in a less favored locality. We honey producers have no packing to do; we let excluders stay on the hives with winter stores above and all empty supers on top of that. If we are too busy to take off the honey sooner, we can remove these supers at any time during the winter without danger of disturbing the brood chamber arrangement. Should stores run short we can put a few full combs above the excluder and the bees will find many warm days in which they can carry the honey down where it is needed. Most of our bees are going into winter with plenty of young bees and adequate stores. Prospects for 1943 look "rosy."—George W. Bohne, Luling, Louisiana.

NORTH DAKOTA, December 7

Weather: While the weather has favored most branches of agricultural production, it was none too satisfactory for beekeeping. Cool, cloudy weather continued well into late spring and seriously hindered gathering from the natural sources. Before the main flow of early July began all hives were low on stores and beekeepers reported occasional loss of colonies from starvation. Hives which had adequate stores, however, were strong with bees and brood, and swarm control became a problem in most bee yards.

For the first few weeks of July the honey flow from sweet clover was excellent and it appeared that a bumper crop of honey was in the making. There was adundance of sweet clover bloom everywhere and prospects were ideal until early August when heavy rainfall occurred over much of the beekeeping area. Beekeepers who had experienced a somewhat similar situation in 1928 recalled how the heavy rainfall then had curtailed the honey flow and expressed the opinion that 1942 was turning out about the same. The northeastern part of the State was the hardest hit. Beekeepers there told me that they had secured only about one-third the honey which was anticipated. In other areas conditions were better and ranged up to excellent yields in some places. The latest federal estimate indicates a state average of 88 pounds per hive.

The heavy rainfall, while unfavorable to the honey crop, improved soil moisture and put the young sweet clover seedlings into excellent condition, which should ensure an abundance of sweet clover bloom in 1943.

Condition of the Bees: While the preparation of bees for wintering was delayed in a number of instances because of labor shortage, it is believed that colonies were taken care of fairly well before severe weather began in mid-November. An unusually early snowstorm (September 25) which resulted in blanketing the ground with nearly one foot of snow in places undoubtedly served as a warning, even though it melted away shortly afterwards. Cellar-wintered bees remained out of doors until about the 20th of November in

the Fargo area. There appeared to be no late honey flow from any source to offset the stores being used. Much uniting of colonies and equalizing of stores was necessary before cold weather set in.

Miscellaneous: The annual meeting of the North Dakota Beekeepers' Association, usually held about this time, will be postponed until there are more urgent matters for consideration, according to Mr. Charles Hausmann, President of the NDBA, Hillsboro, N. D. The long distances which members must travel to a meeting and the gasoline rationing combine to make the holding of a meeting extremely difficult.—J. A. Munro, Fargo, N. D.

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IOWA, December 8

Weather: The season of 1942 carried through its program of unusual weather to the bitter end. Winter weather settled in at Thanksgiving time instead of Christmas. There has been considerable snow which has gradually accumulated. Temperatures have been unusually low. One day was recorded as 19 degrees below normal. In spite of this there have been no sub-zero temperatures in this section of the state. The question is, what effect will this have on the bees? It is too early to more than guess. If it should develop into a prolonged winter the chances are the bees would suffer materially. If the winter breaks relatively early in the spring the chances are that the bees will come through in reasonably good condition. There are some factors, however, which might influence the outcome. Many people were quite late in giving their bees winter protection. These bees will have pulled heavily upon their reserve supplies of honey and energy. Other colonies were low on honey to start with and probably there will be a considerable amount of winter loss due to starvation.

Gasoline for Beekeepers There is considerable confusion right now regarding the allotments for gasoline which have been made by the ODT office. Allotments as low as 10 percent of normal have been reported. This of course will not permit maintenance of the production of last year much less any increased production. An organized effort is being developed in Iowa to give the proper information to the proper authorities relative to beekeeping and the requirements of producers for gasoline during the season. It is expected that relief will be obtained in this respect as has been granted Federal authorities in other items pertaining to beekeeping when the services of the industry were fully appreciated.

Bee Inspection: The inspection program for 1942 has come to the close of a successful season. The area clean-up campaign has been conducted in 21 counties this year increasing from 10 counties in 1941. This has required one additional inspector. The state and county funds have been much improved for this work. The cooperation of producers in the clean-up counties has been excellent. A total of 27,374 colonies were inspected with 5.9 percent of disease as a state average. It is interesting that the disease is low in those counties where the clean-up campaign has been conducted for a few years and is high in those counties where the work was only inaugurated this season.

The educational support for the inspection work will be increased during 1943. Arrangements are now being made to set up a demonstration apiary in each county. These yards will serve as an example of modern equipment and management. They will also serve as a meeting place for beekeepers of the county during the season.

Miscellaneous: The short crop of honey which was harvested in 1942 made it possible for producers to dispose of their holdings during the fall. Honey has been out of the hands of producers for some time. The question now is whether there will be enough honey to meet local demands. The price is in line with the price set by the OPA. It is hoped that the order of the OPA regarding schedule in prices for honey from the producer to the consumer will have a definite effect in opening up the market. Very little honey has been moving on to the market due to the confusion over prices.

A definite program of war requirements for the beekeeping industry has been adopted for Iowa producers. The challenge which has been thrown out by the government officials for increased amounts of beeswax and honey will be met by the

producers of Iowa. The Extension Service is inaugurating a comprehensive campaign to assist producers in every possible way in meeting the goals which have been indicated by Federal authorities.

The increased demand for food production will put a considerable strain on the acres available for crops in Iowa in 1943. Also the planting of biennial sweet clover for a new pasture is outside the AAA program so there is little if any encouragement for planting this crop wholly as a pasture, a practice which has been quite common during the last two years. It looks now as though there would be a material reduction in the amount of sweet clover acreage available for bee pasturage during 1943. Beekeepers are urged to investigate the possibilities of their locality very carefully and be prepared to make whatever shift may be necessary to keep their bees in touch with pasturage.—F. B. Paddock, Ames, Iowa.

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COLORADO, Dec. 7

Weather: In contrast to the dry season of the Western Slope, the Eastern Slope of the state had an over-plus of moisture of one and one-half times that of normal for the year to date. This has kept the soil in a condition favorable for germination of seed and plant growth for our next season's honey crop. We can reasonably expect to see much more sweet clover next season than we have had for some years past.

Crop Condition: It was well into July before the bees were making more than their living. By that time the sweet clover and the second crop of alfalfa began to yield, and a small surplus was secured from these sources. The San Luis Valley had a much better flow than it has had for several years, tending to make up for some of the lean ones. The extracting of the crop progressed much slower than usual, extending in some cases into November after delays from snow and wet cold weather and on account of shortage of help.

The bees have gone into winter in excellent shape, being strong and heavy in stores of good quality. Some increase was made through swarming and division to make up for decrease sustained in previous seasons of poor wintering.

Beeswax: The demand for beeswax continues strong. Leather goods makers, tent makers, and others using little or no wax in the past are anxious to secure this now precious substance at the ceiling price.

Market: There seems to be no slackening in the demand for honey. Already most large lots are out of the beekeeper's hands, and buyers are feverishly making bids for the remaining few holdings. Many grocery stores apparently find it difficult to keep their shelves stocked with honey for any length of time. Taking these facts as an index the indication is that the present crop of honey will be absorbed long before any new honey will appear.—G. A. Pauli, Pueblo, Colo.

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VERMONT, Dec. 6

Weather: After a very dry summer, fall has blessed us with considerable rain, not only improving moisture for next season but giving clovers a good growth for winter. It is now freezing weather most of the time and flurries of snow are making things look like winter. Weather to date has satisfied everybody.

Honey Crop and Market: In spite of the dry summer (or because of it) Champlain Valley had a good honey crop, with us an average of about 100 lbs. per colony, and of good quality. Here in the East it is impossible to satisfy the honey market, the demand is many times over the supply. We had a crop of about 36 tons and to date 28 tons have moved out, almost all of it packed in 5 pound and 1 pound jars. The only reason all of it isn't sold is that I couldn't pack it fast enough. Ceilings are tending to keep prices down so that we find western honey selling here at higher prices than our Vermont honey. This is a very unusual condition as Vermont honey usually sells for twice that of "foreign honey".

Miscellaneous: Due to lack of help not much time was spent this season "a-hunting the deer". My boy of 12 and I did go for a couple of days but said my youngster in disgust, "You couldn't shoot a deer if you saw one". We didn't see one so cannot redeem my reputation as a deer slayer this season

Snow also makes us think again about skiing, but the Japs have put the crimp on that, due to the tire

situation. We'll be able to ski in our own back yard, but traveling up the mountains where snow lies deep is out for the duration. After the honey crop is sold even a trip down South is out for the duration. We'll just have to stay home and get ready to produce more honey and beeswax.—Charles Mraz, Middlebury, Vermont.

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ONTARIO, Dec. 5

Weather: We had a continuance all through the first three weeks of November of the fine weather that had prevailed during all of October. Then a sudden cold snap developed with a low of 9 above zero locally, with much colder conditions farther north. December, to date, has been cold with high winds and a mid-day temperature of about 20 above—colder than usual for this date. With so much good weather during October and November there can be no excuses made if bees were not properly prepared for winter, and it is not likely that this work has been neglected.

Packing Bees for Winter: All our own bees were packed by November 1, except about 20 colonies—18 to be exact—in an apiary of 38 colonies. The boys were preparing to go to this yard and try their hand at packing with shavings or some other insulating material enclosed with tar paper—work that they have never done. Before leaving for the apiary in question, November Gleanings came and I read how a Wisconsin beekeeper winters in two-story hives with no packing except two thicknesses of paper tacked on by lath, with an entrance in the upper story. So we hastily changed our plans and these 18 colonies in double brood chambers are prepared that way for better or worse, and needless to say, we shall be interested to see in the spring how they compare with 20 others in the same yard packed in regular winter cases. Two thicknesses of dark colored asphalt paper are wrapped around each of these hives, fastened with lath to the hives, and paper is folded over tops, and a metal covered telescoping cover is all that is on top. Bottom entrance of ½ inch in depth by 1½ inches in width, and a ⅝ inch hole midway in front of the upper story, constitutes the ventilation provided. Not having had any previous experience in trying to winter bees in this manner, we have been wondering if the bottom entrances provided are too small or too large. The upper stories of these 18 colonies are solid with honey and pollen but the lower stories have little honey and not much pollen. Most of our colonies had little honey in the brood chambers this fall as the queens were confined to single story brood chambers by excluders.

This lean condition of the brood chambers reminds me that at different times we have noticed claims favoring the Caucasian bees as being inclined to slow down on brood-rearing earlier in the fall than do the Italians, and place more honey in brood chambers. If this is true, we would say this is a splendid feature. Can anyone give us positive evidence as to this trait in the Caucasian race of bees? We have no fears as to this earlier cessation of brood-rearing affecting wintering adversely. Many experiences of the past 50 years or more have satisfied us that bees winter just as well here in Ontario when we have a fall flow to stimulate late brood-rearing, as they do when the flow ends in late July.

Miscellaneous: The Convention held in Toronto during the last week in November had a bumper attendance and the majority stayed through the three days. After attending nearly 50 annual meetings without a miss, we cannot recall one with more in attendance. For the first time in many years, none of the Gleanings staff was present, and many of us missed this chance for an annual handshake and pleasant intercourse. No doubt war conditions caused a shortage of help in the Gleanings office and we hope that by another year things may be better in this regard.

"Spinster Jane" in commenting on the demand for honey, page 748, says that they could have sold five tons of honey this year from their door if it had been available. There was no exaggeration in that estimate she can be assured, for well over 20 tons went from our extracting plant, and we certainly could have sold as much more had honey been available. Of course, we live in a much heavier populated area than she does, and a large amount of honey went to customers in Toronto just 20 miles away. Sorry to say that almost no

BEE VENOM THERAPY. A TRIBUTE TO DR. BODOG F. BECK

By Hubert Stern Montagny

In the July number of Gleanings appeared two articles on the therapeutic value of bee venom in arthritis. This first, by Mr Percy H. Wright, was a narrative of personal experiences interestingly presented, concluded with a surmise that the organism develops an anti-body as a result of repeated stings, and that this is the agent which has the power to reduce the violence of rheumatism and arthritis.

The second article, excerpts of a paper by Dr. George W. Ainlay, related the use of prepared bee venom in arthritis, and offered some conclusions on the influence of the venom on sugar tolerance.

It is not my wish to abuse the hospitality of Gleanings and open new polemics on the question. As the Editor of Gleanings well said in presenting the article by Dr. Ainlay, the late Dr. Bodog F. Beck tried the prepared bee venoms and came to the conclusion that the natural hypodermic stinger of the bee does a better job and permits an exact dosage.

What I have in mind is to bring once more to the beekeepers the light shed by Dr. Beck on the subject. After many years of study, he told us that the action of bee venom is both **hemorrhagic** and **neurotoxic.** Whatever the cause of arthritis, we are faced with a condition of **suboxidation.** The bee venom paralyses the nerve endings, unlocks the capillary construction, opens the path for the blood to bring oxidation to the affected parts and flush them.

The results of this influx of blood are manifest. Instead of obtaining heat and blood circulation for a few minutes by means of electric apparatus,—followed by a quick aggravating cooling of the field,—we observe an elevation of temperature lasting for about two days. If we persevere with the treatment, we notice a gradual increase of blood circulation, of reaction to the venom, of functional motion, and a decrease of pain.

What happens inside the joint has been described by Dr. Beck. His conclusions have been accepted by some, rejected by others, and the last years of his life have been embittered by the opposition, often unfair, ignorant and unsupported, of other physicians. We beekeepers don't need to agree on what happens; we simply know that we don't have arthritis as long as we keep bees and receive stings. We enjoy this automatic blessing, but cannot share it with the unfortunate victims of arthritis. All we can do is to direct them to a physician who has made a study of the technique, supply him with bees, and show him how to handle them, until he decides to install a hive in his office.

The physicians who so far have availed themselves of Dr. Beck's technique are so busy treating patients affected with rheumatism, arthritis, neuritis and bursitis, that they don't write about it; the simply obtain results. There was only one Dr. Beck, with a great mind, a great heart, and a rare missionary complex. He devoted years of work and sacrifice to research, and thousands of patients have been relieved and cured during his life time, thousands more will owe their cure to the technique he evolved and the gospel he preached.

Gardiner, N. Y.

(Ontario continued)

honey is available for Toronto customers at present, except in small glass containers.

Well, another season is past with its pleasures (mostly anticipated this year) and disappointments, the latter predominating in most parts of Ontario. By far the greatest number of beekeepers here will do well to pay expenses, with others in a very limited section of the Province having a good crop. But things might be much worse, and personally we feel like rendering thanks to a kind Providence that has permitted us here on this Continent to enjoy so many blessings that are withheld from millions in others parts of the Globe.

Prospects appear good for another year and who knows but that 1943 may be a bumper year. May I personally thank all who have so kindly written me during the past year. I am not too sure that all letters have been answered, but if some were missed, please excuse me and be assured that your kind words were appreciated. That every reader of Gleanings may have a very Happy and prosperous New Year, is the sincere wish of the writer.—J. L. Byer, Markham, Ontario.

Gasoline for Beekeepers

By the Editors

With the commencing of gas rationing on December 1, a fear has been expressed by many commercial beekeepers that insufficient gasoline would be permitted for satisfactory operation for trucks needed to operate the bees. Concern over early reports by commercial producers prompted the National Honey Association and the Bee Industries Association to extend to the beekeepers' associations their cooperation in calling this problem to the attention of responsible Washington authorities. The National Honey Association Secretary, Mr. Lewis Parks, was instructed to contact state beekeepers' associations, American Honey Producers' League, and other organizations to offer the services of the National Honey Association to help in this matter. It was felt that insufficient information was on hand at the present time to make a proper appeal to Washington authorities. The aid of the bee journals was also solicited to collect needed information.

At the bottom of this article you will find a short questionnaire. If you are a commercial operator of bees fill the questionnaire out and send it to Gleanings.

On December 1 a news release by the Office of War Information from the Office of Defense Transportation reads as follows:

OFFICE OF WAR INFORMATION
OFFICE OF DEFENSE TRANSPORTATION
For Immediate Release
Tuesday, December 1, '942. PM-4177

A message to the farmers, stock raisers and dairymen of the United States was issued today by the Office of Defense Transportation:

No farmer is to be put out of business as a result of the Office of Defense Transportation's Certificate of War Necessity plan.

As long as the tires, spare parts and gasoline are available, the ODT will help every farmer get enough tires, spare parts and gasoline to carry on his necessary truck operations.

Any farmer who is dissatisfied with the amount of milage and gasoline allowed in his Certificate of War Necessity for his truck or trucks should take the matter up immediately with his County Agent, his County War Board or his County Farm Transportation Committee.

If the County Agent, the County War Board or the County Farm Transportation Committee is convinced that any farmer should have been granted more milage and gasoline in his Certificate of War Necessity the committee will recommend that a revised Certificate be issued.

This recommendation will be made to the ODT district manager serving the county in which the farmer lives.

All ODT district managers have been instructed from Washington to accept the recommedation of the County Farm Transportation Committees, unless such recommendations contain obvious errors.

* * *

If a Certificate does not contain an obvious error, the farmer's Office of Price Administration War Price and Rationing Board will grant him a gasoline ration in an amount provided by the Certificate. In accepting such a ration, the farmer does not forfeit his right to appeal for an additional gasoline allowance later. Appeals may be filed at any time.

If a farmer has received a Certificate which does not allow enough gasoline to operate the milage allowed in the Certificate or which contains other errors obvious on the face of the Certificate, the farmer should do two things.

First he should go to his OPA War Price and Rationing Board, present his Certificate and ask for a temporary transport ration. This ration will be granted by the OPA board, giving the farmer enough gasoline to operate until Jaunary 1.

Then the farmer should take his Certificate to his County Agent, County War Board or County Farm Transportation Committee and point out than an error apparently has been made. The County Farm Transportation Committee will take up all such cases with the proper ODT district manager.

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At the same time, ODT officials urged farmers to take advantage of every opportunity to save tires, pointing out that the country's 5,000,000 commercial motor vehicles must get along during the next year with less than half the rubber that was consumed in 1941.

We believe from the wording of the above that it is the intent of the Office of Defense Transportation to allow you sufficient gasoline to operate your bees.

Fill in and Mail to Gleanings in Bee Culture, Medina, Ohio.

Name ..... Address .....

No. of colonies operated..... Normal annual mileage needed for bees..... Mileage granted by Office of Defense Transportation ..... Date ..... Have you been turned down on an Appeal for increased mileage .....Reason turned down .....

Spinster Jane Says

To-night, as I write, the mercury is taking a drop—too much. Am sure it will be 30 below zero at least, but let it drop. We can keep the home fires burning, and our bees are snug and warm. Those outside are in wintering cases, warmly packed with dry shavings, and those in the cellar are quiet and content, making no noise whatever. Yes, Boy had to take the risk of cellar wintering again. He could not get time nor proper materials to make cases enough for all his colonies. The cellar is dark, and right now is dry. We don't disturb the bees in going in for vegetables or potatoes, as we use a flash-light.

Our bees seem very contented, but isn't that second nature with all the female sex? Give them a comfortable home, a well-filled larder, warmth, security and pleasant society, and what female was ever anything but content?

"How can you ever live in the country?" was the query a small-town lady put to me. "It must be so dull and lonely!"

Lonely? Dull? Well I should say not! Work there is, of course, but work is necessary if we are to be happy. Besides the round of housework, we can knit and sew both useful and beautiful things. We may read books, magazines, and newspapers. We can listen to radio programs and music in winter, while in summer there is even sweeter music from the birds and the bees. Best of all, there is a world of beauty all around us, beauty that varies with the seasons, and beauty is as necessary as is food.

Sometimes, in this new land, the wolves howl at night, but why mind that? You are safer here, walking through the dark bush, than you would be walking upon many well-lighted city streets. Wild wolves are preferable to the human variety we unfortunately often meet.

"You would be content anywhere," one of my neighbors said. I judged by the tone of voice that it wasn't intended as a compliment, but I took it as such, thanking her, and saying that a contented mind meant happiness.

I listen to the radio a great deal, even enjoying some of the "soap dramas" that never seem to end. I always smile when I hear an announcer urge women to make themselves more attractive, or their hands more beautiful simply to attract one of those super-duper male creatures, and if possible marry him. How times do change! This line of talk belongs away back in the past when females wished to be considered as delicate and fragile; when they were clinging vines yearning for a mighty oak around which they might twine. Small feet and wasp-waists were then marks of beauty. Thanks be, those days are gone forever. Today we admire robust, athletic girls. We like health, strength, and independence in our women, and we know that the women of today are as capable of earning a good living for themselves as any man. Once a woman thought she could obtain security only by marrying. Now we know that she never finds out what a man really is until she marries him, and then it is too late to do anything about it unless she goes a-la-Hollywood, divorcing husbands wholesale. If it be true that "Variety is the spice of life,"—well, we can do without that spice. Too much spice isn't wholesome, anyhow, so our medical men say.

Here in the big smelter, not far away, girls are learning welding, and many are becoming machinists and mechanics. We meet girls in overalls coming from garages where they are taking men's places. One of those old-time, delicate, creatures would swoon at the thought of such work.

A new year is beginning, a year that promises to witness a mighty struggle, before many enslaved nations are emancipated; a year in which every last one of us must do our bit to help win this fight for democracy and freedom. We cannot work, all of us, in great industrial plants, but we can work in our gardens, helping grow foods that will assure the hungry being fed. We "over here" living amid peace and plenty must let them "over there" know that we are standing by in this struggle. When Joshua's hands were upheld, in that long-ago Bible story, he was victorious in fighting a superior force. If not upheld, he lost out. Isn't it our mission to uphold the hands of our boys, fighting on so many battle fronts?

(Continued on page 60)

American Honey Institute News Notes

May 1943 hold Health, Happiness and Honey for all!

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The Annual Directory, "Who's Who in the **American Honey Institute** for 1942" is being made up. Every one who desires to have his name listed should see that his contribution is in the office by January 15. A copy of the Directory will be mailed to those whose names are listed.

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As the news notes are being written a letter arrives from the State of California with over five hundred dollars in cash and pledges for the **American Honey Institute.** This money was contributed at a meeting held at Pomona. We heartily thank you!

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Institute Inklings has been mailed to you. If you did not receive a copy let us know for you will want to read the articles by Mrs. Henry Morgenthau, Jr., Martha Logan (Swift and Company), Harold Clay (up-to-the-minute news from Washington), Lewis W. Parks, Dr. Harriet Morgan Fyler, Dr. O. W. Park, Dr. R. L. Parker, G. P. Walton, Mrs. Aline Hazard, Mrs. E. H. Bremer, Roy A. Grout, and others.

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In order to send a release by franked mail, it is necessary that each piece of mail contain identical enclosures. In the event that you received a pledge card and have already sent your pledge to the **Institute,** you will understand why it is enclosed.

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We are informed that Broiled Honey Cinnamon Grapefruit is a favorite dish for a group of WAVES.

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Stations WHA and WLBL tell us that hundreds of requests are coming in each day for copies of the broadcasts given in December over these stations on Honeyed Fruits and Nuts as Christmas Candy and Puddings for Gala Days by the Director of the **American Honey Institute.**

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Watch the December magazines for the colorful ad with the Honey Nut Cake recipe. This recipe is also being broadcast on a national hook-up each day on Kate Smith's noontime program. The recipe is as follows:

Honey Nut Cake

2 cups sifted cake flour
2 teaspoons double acting baking powder
½ teaspoon salt
⅔ cup butter or other shortening
½ cup sugar
½ cup honey
3 eggs
1 cup finely cut nut meats
¼ cup milk
1 teaspoon vanilla

Sift flour once, measure, add baking powder and salt, and sift together three times. Cream shortening; add sugar gradually, and cream thoroughly, then add honey in thirds, beating well after each addition. Add ¼ cup flour and beat until smooth and well blended.

Beat eggs until thick enough to pile up in bowl; add to cake mixture and beat well. Add nuts. Add remaining flour in thirds, alternately with milk in halves, beating very well after each addition. Add vanilla. Bake in 9-inch tube pan in slow oven 325° F., 1 hour and 5 minutes, or until done. Spread Honey Butter Frosting on top and sides of cake. Decorate top of cake with wreath made of candied cherries and angelica or citron.

Honey Butter Frosting

Cream 2 tablespoons butter; add 2 tablespoons honey and blend. Add ⅓ cup sifted confectioners sugar and cream thoroughly. Add dash of salt. Then add 1 egg white, unbeaten, alternately with 2 cups sifted confectioners sugar, beating well after each addition. Add ½ teaspoon vanilla. If necessary, add more sugar until of right consistency to spread. Makes about 1 cup frosting. **(All measurements are level.)**

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Following are some extracts from letters received in the **Institute** office:

"Thank you so much for the booklets. The Home Economics classes are using them and like them very much."—**From a librarian, Kentucky**

" 'Old Favorite Honey Recipes' is most attractive and so thoroughly usable and sensible that I am anxious to enclose some with Christmas Gifts."—**From Washington**

XUM

Just News

The Annual meeting of the Pennsylvania Beekeepers' Association will be held in Chestnut Street Auditorium, Harrisburg, Pa., January 12 and 13. Dr. E. J. Dyce, Extension Specialist of New York State, is one of the out-of-state speakers. Come.

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The Annual Winter Meeting of Ohio beekeepers is scheduled for January 26 and 27 of Farmers' Week at the Ohio State University, Columbus, Ohio. The banquet has been arranged for the evening of January 26 with plenty of good entertainment promised by the committee in charge. The general theme for the beekeeping sessions will be "Gearing Ohio Beekeeping to Meet War Time Demands". The program committee has invited Dr. J. I. Hambleton, in Charge of Federal Bee Culture Investigations and Dr. C. L. Farrar of the Federal Sub-Station located at Madison, Wisconsin, who are especially qualified to speak on the above subject. A cordial invitation is extended to all beekeepers to attend the Ohio meeting.—W. E. Dunham.

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A ninety-seven-year-old beekeeper, Elijah Vanderwerken, Stamford, Connecticut, passed away on October 16. A watch-maker and jeweler, he retired from active business twenty-seven years ago and took up beekeeping for pleasure and profit. It is said his apiary was one of the best in the vicinity. He was probably a user of honey and possibly that was one of the contributing factors to his remarkably long life.

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The oldest man in Canterbury, N. H., is William W. Wheeler, 90 years old, who has twelve hives of bees and cultivates his large garden as a part of a regular week-day schedule. He takes fishing and hunting trips for recreation.—Paul J. Pirmann, Fulton, Mo.

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The Finger Lakes Producers' Cooperative of Groton, New York, has announced the appointment of Donald H. Lee as Manager, effective December 1st. A graduate of Cornell University in 1924, he has had fifteen years' experience with one of the largest dairy cooperatives in the East and brings to the beekeeping industry technical knowledge readily adapted to the packing and marketing of honey. Born and raised on a farm in New York State, Mr. Lee understands the producers' viewpoint and the problems with which they are faced in marketing their products. — William L. Coggshall, President.

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Harry H. Laidlaw, Jr., State Apiarist of Alabama, has been inducted into the Army, having left for service on December 5. Gene Cutts will be in charge of the Division during Mr. Laidlaw's absence.

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The Middlesex County Beekeepers' Association will meet at 19 Everett St., Concord, Massachusetts, at 7 P.M. on Saturday, January 30, as the State House is closed on that date. Mr. Paul Tolstrup of Melrose and Woodville will speak on "Winter Work and Summer System". Mr. Archibald will be chairman of the supper which is to be put on by the men, this being Ladies' Night. We take this opportunity to wish a happy and successful new year to all.—A. M. Southwick, Pres.

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The Utah Honey Producers' Cooperative intends to hold its annual convention early in January (exact date to be published later, locally) at the Newhouse Hotel in Salt Lake City. Among the subjects to be discussed by prominent speakers connected with the honey industry are: "A. F. B. and War-time Honey Production"; "The Practical Problem of Migratory Beekeepers"; "An Interpretation of the Latest War Orders as They Affect Honey Producers"; "Wax Production for War Needs". Other subjects of both immediate and far-reaching importance will be discussed. Wilford Belliston, the Association president, will be in charge. —William Moran, Sec.

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Through an agreement made with W. F. Straub and Company, of Chicago, H. J. Heinz Company will pack and distribute Straub and Company's Lake Shore Honey. The Straub Company will continue to operate its Lake Shore Apiaries, consisting of 15,000 hives, on the Minnesota-North Dakota border, the honey being turned over to the Heinz Company. In addition, the Straub Company operates six central re-

ceiving stations where honey is obtained from farmers and beekeepers in 13 states. Honey received at these stations also will be turned over to the food concern. The Heinz Company is installing honey packing facilities at its factory in Muscatine, Iowa, and its nation-wide system of warehouses and sales branches will handle distribution of the product. The Straub Company was organized in 1919 as a pharmaceutical supply manufacturer, and first packed honey for medicinal purposes, because of its nutritive value. In 1929, it began general distribution of honey.

Our Wartime Conference Opens in Chicago January 26, 1943 at Hotel Morrison

At least two days and perhaps three days are to be dedicated to the Honey Producing Industry to map out our program for the duration.

With the nation in the midst of a mighty war, our industry desires to put forth unlimited effort to help in the winning of this war. It is therefore imperative that representatives from each branch of the industry assemble to correlate their activities. The immensity of the job facing the industry is staggering. Only by pooled resources can we rise to the nation's needs.

At this meeting we will deliberate and make significant plans for the duration and post war days ahead.

We shall go forth from this meeting with a new perspective and shall be better prepared to serve our country during the war and in the peace that we trust is soon to come.

I am appointing a committee to be called, "The Honey Industry Cooperation For Our War Effort." It is hoped that each member on this committee will make a study of the branch of the industry that he represents and bring that information to the Chicago Conference, where it can be pooled with the other branches of the industry, so that in the final analysis, we will all be pulling the same way and pulling together.

The Committee Members are as follows:

James Hambleton, Beltsville, Maryland, CHAIRMAN;
Alan Root, Medina, Ohio, Representing Manufacturers;
L. M. Dewey, Merritt Island, Georgia, Representing Southern Beekeepers' Conference;
Lewis Parks, Watertown, Wisconsin, Representing American Honey Institute;
Dr. E. F. Phillips, Ithaca, New York, Representing University;
E. C. Davis, Louisiana, and R. E. Foster, Florida, Representing Extension Specialists;
C. B. Gooderham, Ottawa, Canada, Representing Canada;
Carl Killion, Paris, Illinois, Representing Bee Inspectors of America;
Guy LeStourgeon, San Antonio, Texas, Representing Bee Magazines;
R. F. Remer, Sioux Honey Co., Sioux City, Iowa, Representing Packers;
R. E. Filmer, New Brunswick, New Jersey, Representing Secretary American Honey Producers' League;
M. S. Stone, Ogden, Utah, Representing Western Bee Industries;
Walter Diehnelt, Menomonee Falls, Wisconsin, Representing State Beekeepers Association;
L. C. Dadant, Hamilton, Illinois, Representing Beeswax Industry;
Newman Lyle, Sheldon, Iowa, Representing Producers.

Plans are being made to secure a representative from the "Agriculture Marketing Administration", "Sugar Division", "Federal Security Administration", and "Office of Price Administration."

Committee on Organization Improvement

The purpose of this committee is to work out some form of stimulant for the League. Every member of the committee has had a large amount of experience in organization work.

The Committee Members are as follows:

H. J. Rahmlow, Madison, Wisconsin, CHAIRMAN;
V. G. Milum, Urbana, Illinois;
Russell Kelty, East Lansing, Michigan;
James E. Starkey, Indianapolis, Indiana;
W. E. Anderson, Baton Rouge, Louisiana.

Plans are also underway to secure a keynote speaker from the Office of Price Administration for the evening meeting of January 26. We will be there to think and work, so, no banquet.

Both of the above named committees are to meet the evening of January 25 at the Hotel Morrison. Be sure to make reservations early.

JAMES GWIN, President
American Honey Producers League.

Asked and Answered

Calories in Honey

Question.—How many calories in an ounce of honey? What is the food value of honey?—Wm. S. Long, Pa.

Answer.—According to Miss Mary Schwartz Rose, Dept. of Nutrition, Teachers' College, Columbia University, one tablespoon of honey, based on caloric value, is equal to one and three-fourths tablespoons of corn syrup; four tablespoons of maple sugar; one and one-half tablespoons of molasses. Honey has about fifty percent more sweetening value than the best cane molasses. The best grade of cane syrup contains about thirty percent water, while honey contains about seventeen percent.

Cold Weather Cracking Virgin Combs

Question.—On examining my stored combs a few days ago, I found that they had several cracks in almost every comb, usually one horizontal and two vertical, caused, I expect by the zero temperatures to which they were exposed.—Walter W. Burkholder, Ontario.

Answer.—It is common to find virgin combs cracked due to cold weather, especially in the North where winters become unusually cold and the combs are stored in a cold room. Even though the combs in storage may become cracked a little in places, the bees are likely to repair this slight damage without any really bad results. We believe you will find that virgin combs, that is, combs that have never contained brood, will crack easier than darker combs that have contained brood. As a matter of fact, dark combs are not likely to be cracked by cold weather.

How to Keep Bears Away

Question.—This season I am going to have two separate yards of bees a few miles away from town. The yards will be in a logged-off area of fireweed. On a few occasions the common black bear has molested outyards in this district, but only on rare occasions as the bears are not overly plentiful. What sort of prevention would you advise? I have bought a fence-controller, but fear this is not adequate. —W. H. Ramsay, B. C., Canada.

Answer.—A wire fenced charged with electricity, surrounding your bee yard would be effective in driving away bears. This has been tried in regions where bears are numerous. It is very effective. In one instance, the owner of an apiary fixed up a fence with a rather high voltage of electricity, then hid under some bushes some distance away in the yard. A bear came along, touched his nose to the fence, backed off suddenly, stood on his hind legs and then climbed a tree. In a short time the bear came down out of the tree and ambled off into the woods.

Bees and Chickens

Question.—Would the presence of chickens in a bee yard prevent bees from storing a normal crop of honey?—Clyde Meyer, W. Va.

Answer.—Bees and chickens get on together quite well, as a rule. If you have a few chickens running around among your bee hives, the bees do not seem to pay any attention to them. So far as the chickens affecting the behavior of the bees in any way, it does not seem that the bees would gather any more or any less honey because of the presence of the chickens.

Poison from Scraping Frames

Question.—Do you know of any one getting poisoned when scraping frames and extracting? Every time I start scraping frames my hands start to crack and peel. I have a wet cloth to wipe my hands on. This fall and once before my hands and body swelled and peeled all over. The doctor said I got poisoned.—J. R. Warren, Vermont.

Answer.—There is no doubt that propolis scrapings do have an irritating effect on the skin. Just why this is so, we do not know. It is a good plan to wear a pair of gloves when doing this kind of work. Bee glue is nothing but the resinous gums that the bees gather and it varies greatly according to locality. In some places bee glue is almost black and in others it is a light yellow.

Getting Rid of Poor Combs

Question.—I have old, poor combs in the brood chambers of my bee hive and would like to know the best method and the best time to change them to sheets of foundation with the least disturbance to the bees' activity.—Amos J. Charles, Pa.

Answer.—If you will set the new hive with full sheets of foundation on top of the old hive at the beginning of a honey flow, the colony, as it needs more comb space, should move into the new hive. When the queen is found laying in the combs of the upper hive, a queen excluder should be placed under this upper hive in order to prevent the queen from going back down into the old hive. In three weeks after the queen excluder is placed on the hive, all of the brood in the old hive below will have emerged and you can then remove the old hive, shake the bees out of it, and let the new hive down onto the hive stand. Old combs should be rendered into wax.

Keeping Queens Until Introduced

Question.—How long could a queen bee be kept in a cage or otherwise, before she would be introduced to bees?—J. C. Phillips, Alberta, Can.

Answer. — Queens received in mailing and introducing cages, with attendant bees should be kept in a dark room of moderate temperature until they are ready to be used. It should be possible to keep the queens for five days—possibly a week. It is an advantage to sprinkle a few drops of water over the wire screen of the cages each day, to supply the bees with some additional moisture.

Domesticating Bumblebees

Question.—Is it possible to keep bumblebees in small hives?—Loyd McCoy, Ohio.

Answer.—I have had bumble bees in small hives many times, but find that it is hardly worthwhile to start them because it takes nearly all summer for them to build up to strong colonies, and when winter comes they all die except the young queens. These mate and hibernate in the ground. When these young queens come out in the spring each one starts a colony but has no attendants until her brood emerges. They usually start in a mouse nest that has been in a protected place where it has been kept dry all winter. We find bumblebees flying early in the spring. I have not been able to capture them and get them to accept a nest that I prepared for them. The most successful way is to get the boxes ready with a dry mouse nest in them and set them along hedge rows and let the queens find them. Bumblebees are nearly a thing of the past in this locality. Skunks are the enemy that destroys them, and since skunks are protected they have multiplied to such an extent that they destroy nearly all nests on the ground, birds as well as bumblebees. It would be a great help to the farmers if some way could be found to save the bumblebees to pollinate the clover blossoms.—Mel Pritchard.

[Mr. Pritchard, whose recent passing we very much regret, spent a great deal of time studying bumble bees. During the past forty years he has answered many inquiries similar to the above.—Ed.]

Resistance of A.F.B. to Heat

Question.—What kind of heat should be applied to destroy AFB?—Roy. A. Robertson, Tenn.

Answer. — **Barcillus larvae,** the cause of American foulbrood of bees, is highly resistant to heat. Wet heat is several times more effective for destroying the spores than is dry heat at the same temperature. When spores are covered by beeswax, their resistance to dry heat is considerably increased. The rate of sterlization by dry heat can be increased by raising the temperature but this method of sterilization has not been considered practical for beekeeping equipment. Recent unpublished work at this laboratory has shown that boiling lye water is highly effective for destroying the virulence of spores as well as for removing wax and propolis from equipment. We do not feel that the last word has been said on sterilizing beekeeping equipment as further work should bring improvement. At present we refrain from recommending the saving of contaminated brood combs and frames. We feel that it is safer for the average beekeeper to destroy the bees and everything within a diseased hive. The hive itself can be saved and used again by scraping, washing thoroughly and rinsing in clean water.—Jas. I. Hambleton, In Charge Division of Bee Culture, Beltsville, Md.

How to Treat Sour Honey

Question.—I have some honey from a prior year which smells and tastes sour or fermented. Can it be treated in any way so as to be edible?—Paul C. Robins, Pa.

Answer.—The honey you have that smells and tastes sour or fermented should be heated to 160 degrees Fahrenheit and left at that temperature for 10 or 15 minutes. This may be accomplished by placing the container of honey in a wash boiler of hot water over a gas jet. The container of honey should rest on two small sticks so that the bottom of the container may not come in direct contact with the bottom of the wash boiler. The honey should be stirred as heated.

Candied Honey for Spring Feeding

Question.—I have 10 full-depth supers of candied honey that I cannot extract. If I place a super of this honey on a colony with the escape hole in the inner cover open will the bees carry it below?—Carl N. Holcomb, New York.

Answer.—Placing one super on top of each strong colony, over an inner cover with the block removed, scoring the cappings of the combs with a hive tool, should induce the bees to carry the honey down into the brood chambers. If honey is coming in rapidly the bees will not carry the honey down. Later on in the season however, after the honey flow lets up, the bees are likely to carry the honey down. Be sure to put the honey on the hives late in the evening to avoid robbing. It would be possible also to use this honey for package bees next spring.

XUM

Talks to Beekeepers

By M. J. Deyell

To begin this series of Talks for 1943 it occurs to me that all beginners as well as experienced beekeepers are interested in knowing as much as possible about the inmates of the hive. Success in producing maximum crops of honey depends largely on a correct knowledge of bees and their behavior.

The following is taken from a sheet that we have used to supply information regarding members of the honeybee family:

THE CITY OF THE BEES

A colony of bees is a little city in itself. It has regular streets and alleys for the passage of its inmates and those streets are kept clean. In some respects it is like the human kind but in another way it is organized on a different scheme that has for its goal the survival of the fittest irrespective of ethical or moral rights.

The House the Bees Live In

The house (the bee city) the bees live in is air cooled, or more exactly "air conditioned," in hot weather. The temperature inside is always the same, no matter how oppressively hot it is outside. It is thought that for thousands of years bees have known and used the science of ventilation and air conditioning. The wise man has said, "Thou sluggard, go to the ant." If he had said, go to the bees, he would have been wiser.

In the bee city there is no mayor or city manager, no city council, no political boss and while there is a queen she does not direct its policies nor its destinies. Nevertheless in all the realm of nature there is not a more efficient organization. Its police force is the best in the world—not for regulating the inmates of the city, but to keep out the burglars, the thugs, and the racketeers. Let one of these approach the gates of the city, and be it the naughty boy or one of its own kind, he or she will be so severely treated that they will retreat in utter rout.

The inmates are all for one and one for all. There is perfect co-operation and unity of action. There are no jealousies, no strife for political preferment, no unions and no strikes. They co-operate and do not fight among themselves. They are intensely patriotic, and if need be will fight their enemies. Their prowess is not questioned by any living thing that creeps, walks or flies. Even man has a most wholesome respect for them. Man must deal with them if at all on their terms.

Their scheme for the division of labor is the best in the world. Every worker knows her precise job and does it without being told or shown by a superior, for there is no superior.

In this bee city there is no unemployment problem. Nor is there any unemployment or old age pension. None is needed. The population of the city is carefully regulated to the seasons and the amount of work to be done. This means, of course, a perfect scheme of birth control. When depression or a bad season comes the bee city stops raising more babies. When there is danger of the city starving the control bees will dump the half-grown babies (bees in the larval form) out at the city gate to die. If any of the full grown youngsters are crippled, sick or not fully developed, they, too, are shoved out of the city to die. In addition to all this, the old workers whose wings are worn out by toil are made to leave the city. If they do not go out voluntarily they are kicked out. What is the use, they say, of raising a lot of babies or cripples and keeping a lot of old folks that can't work any more? To feed the unborn and those that can't work might mean that all would starve. Every one works but father (the drone), and even he is ruthlessly kicked out when his services are no more needed.

If the queen does not rule or boss, what does she do? She lays all the eggs, one or two thousand a day, and if she falls down on the job she, too, is kicked out and another takes her place. The slogan is efficiency. If you don't work or can't keep up your end of the job in that bee city you shall not eat and so the halt, lame and inefficient must die that others may live; and so the slaughter of the innocents goes on. This, in short, is the political economy of the bee city. In some respects it may be emulated by man. In others, it is too cruel and heartless. Man wouldn't stand for it, but he will receive a dole, even though in many cases able to work.

Worker

Queen

Drone

Interesting Facts About Bees

There are approximately from 15,000 bees in the spring to 75,000 during the hight of the season in the bee city known as a "colony."

The Queen

Normally there is but one queen-bee in a colony or city.

As a rule, two queens do not get along peaceably in the same city at the same time. One usually kills the other.

Queen mother and queen daughter may, however, live peaceably together for some weeks; but mother-in-law and daughter-in-law, never.

When two queen bees start fighting they not only try to sting each other, but they will pull each other's hair in real woman fashion. The queen stings only a rival queen.

A queen-bee can lay her own weight of eggs in one day. She will lay, in the first two months in the spring, from 300 to 1000 eggs in a day; and in the next month, or just before the main honey flow, she may lay 2000 eggs a day. She can be the mother of 100,000 workers (undeveloped females) in one bee-hive. If the old bees did not die off at the age of a month or six weeks in the height of the honey flow she might have twice that number.

The same egg that will produce a queen will produce a worker-bee in 21 days. The larvae of the worker-bee is fed a coarser food by the nurse bees in the hive and for that reason it is not developed into a perfect female like the queen and not so quickly. In this way the bees can of their own will produce either a queen-bee or a worker-bee from one and the same egg.

The Workers

The life of a worker-bee in the Northern States, where the winters are cold, may be six or eight months, extending over the less active season of the year—fall, winter and early spring. But a worker-bee hatched just at the honey-gathering season in summer is likely to wear out its wings and life in a few weeks in the intense work of filling the hive with honey. It often falls exhausted outside the hive and there dies. If it does not leave the hive the younger bees push it out of the hive as of no further use. If the old bees attempt to go back the young ones, without gratitude or conscience, pick them up, carry them on the wing perhaps half a mile and then drop them. They can't walk back. They can't fly back, and so they die.

The bees that gather the surplus crop of honey do not eat it. The bees that eat it did not gather it because the generations change so rapidly. But the colony lives on. The same rule applies in the human family.

The Drone

A drone, which is a male bee, has no father; but, strange to say, he always has a grandfather (a maternal grandfather). The queen-bee lays an unfertilized egg to produce a drone —a clear case of parthenogenesis, or virgin birth.

The drone-bee is not permitted by the worker-bees ever to live more than one summer season. He dies after mating with the queen, or is driven out of the city or killed by the worker-bees at the close of the honey-gathering season to save boarding him. He is a happy loafer, never working, always fed by others, a regular "man about town," until fall comes—and then suddenly nobody cares for father.

The drones are usually killed off or starved by the bees themselves after

(Continued on page 61)

Dr. Maurice C. Tanquary

I have already given preliminary sketches of Dr. M. C. Tanquary and Dr. Mikola Haydak on page 684 of the November issue of Gleanings. Again in the December number, I told something about the romance of sweet clover in North Dakota and Minnesota with particular reference to Dr. J. Alex. Munro, Entomologist of the Agricultural College at Fargo, North Dakota. In this issue, I desire to go more into detail of the colorful career of Dr. Tanquary, of the University of Minnesota, located at St. Paul.

Dr. Maurice C. Tanquary

By E. R. Root

Modest to a fault, of a retiring nature, the subject of our talk this month has had a most remarkable career. Three years in the Arctics among the Eskimos, as an explorer and scientist, one year with the Eskimos alone, entomologist at four leading universities, keeping bees in the North all the way down to the tropics (on a large scale), one almost wonders how Dr. Tanquary could have covered such an extended career without having his health completely broken down. But when I saw him at the University of Minnesota, he seemed to be in perfect physical condition and enthusiastic about his work, especially along research lines.

Dr. Tanquary was selected as one of the scientists of the Crocker Land Arctic Expedition headed by Donald B. MacMillan, and after three years up in the frozen North, he entered the lecture platform covering a period of three months during the winter. I have seen his Arctic slides and only wish that our readers could see them.

As it is, I am pleased to present here a brief of his life work:

Dr. Tanquary was born and spent his boyhood on a farm near Lawrenceville, Illinois. He taught four terms in the public schools of Lawrence County, and dur-

The "Eric" which took the expedition to North Greenland

From 1913 to 1916 Dr. Tanquary spent in North Greenland

ing parts of those years attended Vincennes University, Vincennes, Indiana. Graduating from this institution in 1903, he entered the University of Illinois in 1905, graduated in 1907. He was Assistant in Zoology and Entomology and took graduate work at University of Illinois from 1907 to 1912. Received the degree of Master of Arts in 1908, Ph. D. in 1912. Attended Harvard in 1910 for graduate work.

In 1912-1913 he was instructor in Entomology and Zoology, Kansas State College, Manhattan, Kansas. In 1913-1916 he was given a leave of absence to serve as zoologist under Crocker Land Expedition headed by Donald B. MacMillan and sent out under the auspices of the American Museum of Natural History, New York City, University of Illinois, American Geographic Society and Bowdoin College; 1916-1918, Assistant Professor of Entomology, Kansas State College; 1918-1920, Associate Professor of Entomology, Kansas State College; 1920-1924, Chief, Division of Entomology, Texas Agricultural Experiment Station, and State Entomologist of Texas, College Station, Texas.

In 1928 he was invited to take the position of Professor of Agriculture, University of Minnesota, recently made vacant by the resignation of Father Jager. This came as a surprise to him as he was not considering going back into teaching.

Dr. Tanquary is a Fellow of the American Association for the Advancement of Science, American Entomological Society and Association of Economic Entomologists; was vice-president of the latter group in 1923; is a charter member of the Entomological Society of America and is a member of the Sigma Xi Scientific Fraternity.

While Dr. Tanquary was Assistant Professor of Entomology at Kansas State College, he came in contact with Dr. J. H. Merrill, then in the same department of the college. It was Dr. Merrill's enthusiasm that helped and influenced Dr. Tanquary to give more and more of his time to the study and practice of beekeeping. It was while there that he studied the package bee business and its possibilities.

In the spring of 1924 Dr. Tanquary resigned his position as State Entomologist of Texas, and went to North Dakota to go into the bee and honey business. He bought equipment and then 250 2-lb. packages of bees. The season was unfavorable but the locality in North Dakota at that time was at the peak of its honey production. With this start of 250 packages of bees Dr. Tanquary actually produced a carload of honey. This was written up in Gleanings on page 144, March, 1925. While the season was backward at the start, yet sweet clover was at its best and Dr. Tanquary made a record that no one will perhaps equal. During average seasons and in average localities one would hardly be able to reach such a record now. It is apparent Dr. Tanquary used his scientific knowledge to back up his practical with the results stated.

Dr. Tanquary works part time with the University of Minnesota but during the summer he has an arrangement whereby he devotes his whole time to the keeping of bees. He now has under his control 14,000 colonies, and his operations now run all the way from North Dakota down into Florida. If there is another man as extensively engaged in beekeeping, also a scientist, as Dr. Tanquary, I do not know of him, and I have met hundreds of car load producers in the field.

XUM

Highlights from Illinois

By H. H. Root

The Illinois State Beekeepers' Association was fortunate in having at its fifty-second annual convention in Springfield, November 13 and 14, both Harold J. Clay and W. R. Nolan of Washington, D. C. My train from Chicago being late, I missed the whole of the first session on Friday morning and I had to leave before the last session Saturday afternoon. My general impression formed during the meetings and in conversation with producers, convinces me that Illinois beekeepers will do their part, thankful for the opportunity, and accepting conditions having to do with lack of help and equipment with a determination to go forward. The very small crop of 1942, while regretted by everyone, has not detracted from the stern resolve to do the best possible in 1943.

We can give only a few highlights of what some of the speakers said:

Dr. V. G. Milum

Dandelion honey granulates with such a gritty, hard crystal that the bees are unable to use it in winter.

Sweet clover weavil looms as a great threat to sweet clover honey production in the state. Weavil-infested plants, not over three or four inches high, contrast markedly with uninfested plants of normal 18 inch high at the same time. This is something to watch most carefully for if sweet clover cannot be depended on in Illinois, what can Illinois producers depend on?

Light packing does very well during mild winters, but in severe winters, colonies with too little protection die by the thousand.

W. R. Nolan

There are four main reasons for the honey restricting order, M-118. First, to conserve honey for the housewife. Second, to provide a normal supply of honey for manufacturers who have always used it. Third, to supply honey for the Army and Navy. Fourth, to approximate the demand to the supply.

Mr. Nolan is hopeful that there may be 60-lb. cans for 1943 but nothing definite has yet been decided.

Any beekeeper failing to get sufficient sugar through his Sugar Rationing Board, may appeal to the State Rationing Board. However, if sugar should not be forthcoming, the beekeeper in question is privileged to write W. R. Nolan.

Harold J. Clay

Inasmuch as on September 16 the Department of Agriculture ruled beekeeping an essential industry to war effort, deferments from active service are not impossible. There is likely to be more to say on this subject in the near future.

If sugar should be needed this fall in excess of the ten pounds per colony allowed for the year, it is possible to obtain sugar borrowed from the 1943 allowance.

In all probability, no tin cans smaller than the 60 pound will be available; for five and ten-pound packages, glass must be substituted.

Dr. F. M. Clark

Assistant Professor of Bacteriology
University of Illinois

While yeast cells are found in nectar, the number is very much smaller than the number often found in honey. It is not unusual to find from 100,000 to 400,000 in a gram of honey (one-twentieth of an ounce). These cells develop very rapidly.

A cell of honey carefully protected from outside yeast may have as high as 300,000 yeast cells. The average number of yeast cells in extracted honey may be around 1000 per gram. In case of uncapped honey, the maximum may be as high as 600,000 per gram. While yeast persists in samples of honey having a high moisture content, it is easily destroyed by heat.

Carl Killion, in 1940, had over 400 supers of beautiful comb honey otherwise, greatly damaged by fermentation.

Bakers' yeast, brewers' yeast, etc. will not develop in honey.

Leonard Robbins

Manager, The Illinois Cooperative

He is not sure that M-118 has been of any great help to producers. However, the law is not as serious as it was feared at first.

In commenting on the value of beekeeping as a war industry, Mr. Robbins referred to the beekeeper who has say, 300 or 400 colonies of bees, and who produces 50,000 pounds of honey. If the bees are worth ten times as much for pollinating, then this 400 colony man is worth $50,000, or twice what a man is supposed to amount to in war effort.

Honey and Feeder Cans in 1943

On December 9 the Container Division of the War Production Board released a revised Conservation Order M-81 covering containers made of tin plate, terne plate, black plate or waste metal. This new Order further limits the use of cans for certain products and eliminates altogether their use for other products. The Order also specifies the size can which may be used for a given product. The use of cans for civilian consumption has been eliminated on vegetable juices, cranberries, grapefruit segments, sauerkraut, baking powder, etc. Shoe polish, for instance, may not be packed in metal containers after March 31. Also varnishes and lubricating oils may no longer be packed in metal containers. The quota on soup packing has been reduced to 50% of the 1942 pack and confined to one size can.

It appeared likely two months ago that even 60-lb. cans would be eliminated for use in packing honey. However, through the efforts of the industry leaders and the cooperation of Sugar Section of W.P.B. the Container Section of W.P.B. was convinced of the necessity of allowing 60-lb. cans for honey. The new Order grants the use of 60-lb. cans, new and used, in packing an amount of honey equal to the 1942 crop.

The five and ten pound metal containers permitted under the original M-81 may no longer be used under the new amendment, except where the cans were completely manufactured on or before December 9, 1942. This Order does not prevent the use of glass containers which may be substituted for the tin plate containers. No new certificate is required for the sale of cans where a certificate has already been filed with a supplier.

In addition to the 60-lb. can for bulk honey the Container Division of the War Production Board has also allowed cans to be used for bee feeders for use in shipping package bees. These may be used to the extent of 100% of those used in 1942 in two, two and one-half and three pound friction top cans.

AN OLD FRIEND

Dr. H. A. Scullen, Professor of Entomology at Oregon State College. This picture was taken May 24, 1942, by Eloise Hamilton for the "Garden and Home Magazine" of the Oregon Journal, and appeared in their June 1st issue. The picture was taken at the apiary of H. J. Moultrie when a class in apiculture visited that yard.—Photo sent by Marjorie Jorgensen.

Buy and Sell Here

CLASSIFIED ADS

Only responsible advertisers and honest advertisements will be admitted to these columns. References required from new advertisers not known to us: Rate. 8 cts. per counted word, each insertion. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it), count as one word. Copy should be in by the 10th of the month preceding.

HONEY FOR SALE

CHOICE MICHIGAN clover honey in new 60's. David Running, Filion, Mich.

NORTHERN MICHIGAN clover honey in new 60's. C. J. Freeman, Mesick, Mich.

WILL HAVE more tupelo honey May 20th. Marks Tupelo Honey Co., Appalachicola, Florida.

Orange, palmetto and mangrove honey in new 60's. Peter W. Sowinski. Fort Pierce, Florida.

HONEY FOR SALE—We buy and sell all kinds, any quantity. H. & S. Honey & Wax Co., Inc., 265-267 Greenwich St., New York.

WE BUY AND SELL all varieties of honey. Any quantity. Write us for best prices obtainable. The Hubbard Apiaries, Onsted, Michigan.

HONEY PACKERS—Write us for prices on carload lots of California and Western honeys. We stock all varieties. Hamilton & Co., 1360 Produce St., Los Angeles, Calif.

NEW YORK State comb and extracted honey; buckwheat and clover, any quantity, all size packages. Five-pound pails my specialty. Edward T. Cary, Midland Ave. and Tallman St., Syracuse, N. Y.

SOLD OUT of Michigan clover honey. We thank you. Will see you another season, with more bees. Again thanking our many customers, we remain, E. D. TOWNSEND & SONS, Northstar, Michigan.

FANCY WHITE CLOVER COMB HONEY. $5. case; No. 1, $4.50. In window front cartons. Good used 60's, 35c case. Extracted honey and bench metal working lathe wanted. Bizzy Bee Ranch, No. Abington, Massachusetts.

FOR SALE

QUEENBEE PAINTING outfits $1.00 postpaid. Southwick Apiaries, Waban, Massachusetts.

FOR SALE—1000 used bee shipping cages, mostly 2 lb., good condition, 20c each, feeder cans included. A. A. Martin, Mitchell, Nebr.

COMB FOUNDATION at money-saving prices. Plain, wired and thin sections. Wax worked at lowest rates. Comb and cappings rendered. Robinson's Wax Works, Mayville, N. Y.

WRITE FOR CATALOG. Quality bee supplies at factory store prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Manufacturers of Bee supplies, Onsted, Michigan.

THE ONLY complete line of wax rendering equipment ever offered—the "Perfection" Line. A size and type suitable for every commercial beekeeper. Write for descriptive circular. Robinson's Wax Works, Mayville, N. Y.

WAX WORKED into quality medium brood foundation for 16c per pound: 100 pounds, $12. Fred Peterson, Alden, Iowa.

SAVE MONEY by letting us work your wax into wired or regular comb foundation. Large catalog describes everything. You pay only wholesale factory prices, as we have no agents. Walter Kelley Co., Paducah, Kentucky.

FOR SALE—Modified-Dadant equipment for 100 colonies, mostly new in 1938. Have saved about 1000 pounds of honey in brood combs for spring feed from 1942 season. Guaranteed free of A.F.B. Any reasonable offer considered. S. E. Larson, Sanish, North Dakota.

HONEY AND WAX WANTED

BEEKEEPERS TAKE NOTICE—We will not guarantee any honey buyer's financial responsibility, and advise all beekeepers to sell for cash only or on C. O. D. terms except where the buyer has thoroughly established his credit with the seller.

HONEY WANTED—Comb and extracted. Wm. March, 2585 E. 128th St., Cleveland, O.

WE PAY CASH for extracted clover honey. Fair-Field Honey Company, Millersport, Ohio.

WANTED—White and amber honey; any amounts. D. F. Treap, 317 Keenan Ave., Cuyahoga Falls, Ohio.

WANTED—Honey and beeswax. Mail samples, state quantity and price. Bryant & Cookinham, Inc., Los Angeles, Calif.

HIGHEST cash return made the day we receive your beeswax. Write for shipping tags and quotations. Walter T. Kelley Co., Paducah, Kentucky.

CASH PAID for extracted white clover or light amber. Send samples and best price to Honeymoon Products Co., 39 E. Henry St., River Rouge, Mich.

WANTED—Extracted honey in ton lots or more. Send samples and quote price delivered here. C. J. Morrison, 1235 Lincoln Way West, South Bend, Ind.

WANTED—White clover and light amber honey. Any amount. Cash at time of delivery. Clover Blossom Honey Co., 712 Kossuth St., Columbus, Ohio.

HONEY WANTED—Truck or carload lots delivered to Sioux City, Iowa. Write us at Wendell, and submit sample. R. D. BRADSHAW & SONS, Wendell, Idaho.

WANTED—All grades of comb and extracted honey. Bee supplies and honey containers for sale. Prairie View Honey Co., 12243 12th St., Detroit, Mich.

WANTED—We pay cash top price for clover honey in 60-lb. tins. Any quantity. Send samples and best price. Cloverdale Apiaries. F. M. Babcock, Fredonia, N. Y.

WANTED—White and light amber extracted in 60's. Also beeswax. Send samples with best CASH price. We carry complete line of Owens-Illinois new "DURA-GLASS" honey containers. Honey and wax accepted in payment. ALEXANDER COMPANY, 819 Reynolds Rd., Rt. 3, Toledo, O.

BEES AND QUEENS FOR SALE

CAUCASIANS, package bees, and queens. Write for 1943 prices. Lewis & Tillery Bee Co., Greenville, Ala.

SELECT Italian queens, untested. 75c; tested, $1.50. WHITE PINE BEE FARMS, ROCKTON, PENNA.

BRIGHT ITALIAN AMERICAN QUEENS. Wintered in strong nuclei, 70c each. D. W. Howell, Shellman, Georgia.

FOR SALE package bees, queens, and 3 and 4 frame nuclei. Write for 1943 prices. WALKER APIARIES, Lexington, Texas.

THREE - BANDED Italian bees and queens. Let us quote you prices for 1943. Alamance Bee Company, Geo. E. Curtis, Mgr., Graham, N. C.

CAUCASIAN BREEDERS ONLY—Laying queens, 75c; tested, $2.00; 2-lb. package and queen, $2.30; 3 lbs., $3.00. Miller Bros., R. D. 1, Three Rivers, Texas.

150 heavy single-story colonies with one extracting body or two shallow supers, $10.00 each. Bees guaranteed free from disease. Joseph Dolezal, Route 2, Lincoln, Nebraska.

GREEN'S Italian queens. Do you want the best to be had at a price you can afford to pay? 50c each any number. Start shipping about March the first. D. P. GREEN, Deland, Fla. R. 2.

NOTICE. To our friends and customers. I am in the Army. Send your orders for bees and queens to Tillery Brothers, Greenville, Ala., who are operating our apiaries for the duration. R. B. Skinner Bee Co., Greenville, Ala.

FOR SALE—Complete outfit 250 colonies, extracting supers and frames, Root 45-frame extractor, uncapping machine, tanks, small extractors, trailer, containers and other items. Bees are guaranteed free from disease. MacNeill, 11339 S. Bell, Chicago.

WANTED MISCELLANEOUS

WANTED—Coleman 457-G. handy used gas plant. S. Peterson, Montgomery, Minn., R. 2.

WANTED—Apiaries to run on shares. Good reference furnished. Charles Jones, Jr., Hannibal, N. Y.

TO EXCHANGE printing by a farmer in spare time for honey, seeds, etc. Howard T. Burke, Route 3, Ashtabula, Ohio.

WANTED—Old bee books and magazines. Will pay cash for same. Send list to American Bee Journal, Hamilton, Illinois.

MAKE US an offer on 800 used 2 or 3 pound empty package bee cages. Will trade for bees. L. S. GRIGGS & SON, 711 Avon St., Flint, Mich.

WANTED—New or used Simplicity Extractor, 45-frame, and large Brand Melter. Give particulars in first letter. Box 2, Gleanings, Medina, Ohio.

HELP WANTED

WANTED—Experienced bee man. State wages expected and give other particulars

HONEY WANTED
Carloads and less than carloads. Mail sample and best prices in all grades.
C. W. AEPPLER COMPANY
Oconomowoc, Wisconsin

WANTED--Extracted Honey All Varieties
Send samples and delivered prices to
JEWETT & SHERMAN COMPANY
Cleveland, Kansas City and Brooklyn

WANTED—White and amber extracted honey. Fancy comb, also No. 1 comb honey. Comb honey in shallow extracting frames. Beeswax. We render old comb into wax. Prompt remittance. Write us.
THE FRED W. MUTH CO. • CINCINNATI, O.

GASPARD'S
Package Bees and Queens
Booking orders for Spring 1943 delivery. Book your orders early and reserve shipping date. Write for prices.
J. L. GASPARD
HESSMER, LA.

Why not book your orders now for Homan's 3-banded Italian Bees and queens.
2 lb. Pkgs. with queen.
1 to 24 ....$2.85 25 to 49 ....$2.60
50 to 499....$2.50
3 lb. Pkgs. with queen each.
1 to 24 ....$3.75 25 to 49 ....$3.60
50 to 499 ....$3.50
Queens.
1 to 24 ....$ .85 25 to 49 ....$ .80
50 to 499 ....$ .75
HOMAN BROS.
SHANNON, MISS.

We would urge you to—
BOOK YOUR ORDER NOW.
Italians - Caucasians.
WEAVER APIARIES
Navasota, Tex.

Put your savings to work for you by buying War Savings Stamps and Bonds

FOR 1943

York's Package Bees and Queens

QUALITY BRED ITALIANS

HELP US TO SERVE YOU BETTER

DO NOT WAIT

PLAN NOW

WRITE FOR PRICES

ORDER EARLY

YORK BEE COMPANY

JESUP, GEORGIA.

(The Universal Apiaries)

The Word

SERVICE

In 1943

Is First In The Minds of Every True American.
It Should Also Come First When You Consider Your Source For Buying.

Package Bees and Queens

All Air-Conditioned.

Does Puett Service, Puett Quality and Puett Promptness, mean anything to you? Each should be considered before you place your order.
Write today for literature and prices Tell us about what you will want, and when. We will quote you and tell you why our service is best.
Only when reservations are made early can you be sure of getting your bees shipped on exact dates wanted.

The PUETT COMPANY

HAHIRA, GA.

in first letter. Western State Apiaries, Fullerton, California.

WANTED—Man to work with bees. Give references and complete details in first letter. Steady work to right man. C. H. Schader, Sunnyside, Wash.

WANTED—Experienced man in queen, package, and honey production. Year around work. Give full particulars when replying. Al Winn, Rt. 1, Petaluma, Calif.

WANTED—Man for general bee work. Must have some experience. Reliable and clean habits. Married man preferred. Can furnish all year work. E. L. Lane, Trumansburg, N. Y.

WANTED—Experienced bee-man, married or single; also helper with some experience. Write full particulars including age, experience, wages. Barrett Apiaries, Howell, Michigan.

WANTED — Experienced or inexperienced help. Give age, weight, height, and experience, with wages expected, room and board included. SCHULTZ HONEY FARMS, RIPON, WIS.

WANTED—Man for coming season, some experience preferred. Start early. Good wage with board furnished. Give particulars in first letter. Fred D. Lamkin, Union Springs, New York.

HELP WANTED—Man with several years' experience with bees, and one with less experience, married or single. Highest wages paid to well experienced help. M. E. Ballard, Roxbury, N. Y.

WANTED—Man to work in large apiaries consisting of 6000 colonies of bees. Must have some experience. Good wages and opportunity to man who will qualify. Give qualifications and experience. Powers' Apiaries, Parma, Idaho.

WANTED — Experienced beekeeper to work 300 hives on shares. Use of honey house, extractor, etc., included. Also another man to work as helper from May to November. Board and room furnished. Burghardt Honey Farm, Jewell, Ia.

WANTED — An experienced man in queen-rearing, honey production and honey packing house, year round job. State age, experience, and wages expected. Can furnish house for married man. If using intoxicating drinks, need not apply. J. W. Reitz, Summerfield, Rt. 1, Florida.

MAGAZINES

THE INDIAN BEE JOURNAL—The only bee journal in India. Sample copy free. Yearly, 7c6d. Apply Editor, Indian Bee Journal, Jeolikote, Dist., Nainital, U.P., India.

A BEE JOURNAL edited and published for Western Beekeepers. One dollar per year. Clubbed with Gleanings for $1.75 per year. Western Honey Bee, 3905 Lemon St., Riverside, California.

READ the South African Bee Journal to be conversant with conditions from far afield. Subscription 5/ per year. For further particulars, write to the Hon. Treasurer, P. O. Box 43, Cleveland, Johannesburg, S. Africa.

WESTERN CANADA BEEKEEPER, official organ of the Manitoba Beekeepers' Association, one year, $1.00; in combination with one year's subscription to Gleanings in Bee Culture, $1.60. Wallingford Building, Winnipeg, Canada.

THE BEEKEEPERS MAGAZINE, published monthly, brings you the News from the field of beekeeping. Subscription: $1. a

year. Single copy of current issue, 10c. THE BEEKEEPERS MAGAZINE, 3110 Piper Road, Lansing, Michigan.

POULTRY PAYS MANY—Let Ameria's leading poultry magazine guide you. Newest ideas, successful methods. Questions answered free. One year only 25c; five year $1. Poultry Tribune, Dept. 19, Mount Morris, Ill.

MANY BEEKEEPERS have proven raising fox, mink, nutria, muskrats, rabbits, highly profitable. Send dime for sample copy. Canada's oldest fur farming magazine telling how. Fur Trade Journal of Canada, Box 31, Toronto, 2, Ontario.

THE BEE WORLD—The leading Journal in Great Britain and the only international bee review in existance. Specializes in the world's news in both science and practice of apiculture. Specimen copy post free, 12 cents stamps. Membership in the Club, including a subscription to the paper 10/6. The Apis Club, L. Illingsworth, The Way's End, Foxton, Royston, Herts, England.

Caucasian Package Bees and Queens

More and better bees is our aim for 1943, let us know what your requirements will be.

BOLLING BEE CO.
Bolling, Alabama

CARNIOLANS CAUCASIANS

Both races winter well, build up rapidly during spring, gentle, prolific, wonderful workers. Queens and packages in season. Ask for free circular and prices.

ALBERT G. HANN, Glen Gardner, New Jersey

ITALIAN BEES AND QUEENS

2 lbs.	Bees	with	young	queen,	.....$2.75
3 "	"	"	"	"	3.45
4 "	"	"	"	"	4.15
5 "	"	"	"	"	4.75

Booster packages, deduct 75c ea.
Satisfaction guaranteed, 20% deposit on booking orders.

THE CLOVER BEE FARM
Hessmer, La.

Our price list for 1943 is now ready. Write for your copy. Our service will be the best possible under prevailing conditions. Orders booked and shipped in rotation.

Caucasian Apiaries

Castleberry, Ala.

HONEY PRODUCERS

1943 presents great possibilities for you

Honey has moved well and at a good price the past season. We understand that a 12c ceiling has been placed on honey, which is good.

Place all your equipment in use next spring by purchasing.

Italian Package Bees and Queens
with Quality Imported Strain

They are GENTLE, PRODUCTIVE, CONSERVATIVE of stores, and WINTER well.

One trial and you will see the difference.

2 lbs. with young untested queen. $2.50
3 lbs. " " " " 3.20
P. P. orders add 10 cents per package plus postage.

"THEY PRODUCE"

We have supplies for cages, and bees are in good condition. Reserve your shipping date by placing your order NOW.

Rossman & Long

P. O. Box 133 Moultrie, Ga.
Mail card for literature and prices.

HONEY WANTED!

MAIL SAMPLE

We are in the market for light colored honey.

The A. I. Root Co.

Medina, O.

XUM

SPINSTER JANE SAYS

(Continued from page 44)

Honey has come into its own as a staple sweet. In many homes it is fast supplanting sugar. Beekeepers everywhere can help in this new year by increasing their colonies, by giving their bees greater care and attention, thus increasing their honey yield, and the quantity of beeswax produced, now so necessary in many industries. There is no more fascinating or interesting work to be found than caring for honey bees. Of course, you may get stung, but why grumble about it? It is simply an inoculation making you more immune to rheumatism.

Let "More Honey" be our slogan, and make 1943 the best honey year yet. And what better way can we await the ushering in of the new year than by resolving to do our best to serve in every helpful way we can, as many as we can, as long as ever we can serve our country and our fellow men.

You have all heard of that wonderful man, George Washington Carver, and let me quote two verses of one of his favorite poems:

"It isn't the size of your pile in the bank
Nor the number of acres you own;
It isn't a question of prestige or rank,
Nor of sinew, or muscle, or bone;

It isn't the servants that come at your call
Whether many, or little—or nothing at all—
It isn't the things you possess,
It's service that measures success."

—Spinster Jane.

GOVERNMENT HONEY MARKET

(Continued from page 5)

lots and large lot sales were reported than in any recent period. In general prices on both honey and beeswax have held around ceiling levels recently established by the Office of Price Administration. However, some sales of both these commodities are being reported at higher prices. In this connection it might be well to bring to the attention of beekeepers that portion of the OPA regulations covering these two commodities the provisions on enforcement which read in part "Persons violating any provision of this maximum price regulation are subject to the criminal penalties, civil enforcement action, license suspension proceedings and suits for trouble damages provided for by the Emergency Price Control Act of 1942, as amended." The amendments to Maximum Price Regulations No. 255 and No. 256 which deal with "Wholesalers permitted increase" and "retailers permitted increase" on honey have not yet been released.

BEE BREEDING

(Continued from page 19)

cell was removed. With Apis indica the laying workers keep right on laying after the virgin emerges and may continue to do so for some time. Most of the cases of this phenomenon which attracted our attention were at seasons other than the normal swarming season for the area. We interpret this as an attempt at or a provision of nature to ensure that drones are available for mating with the expected virgin queen. Whether or not the virgin ever actually does mate with one of these drones would be very difficult to confirm. In one instance which we observed the drones all disappeared after some time and still the young queen did not lay. Several weeks passed and the worker bees began to die of old age. We started daily feeding of a 50% sugar syrup and within three days the queen started laying eggs which produced worker brood. In other instances the workers gradually stopped laying and the queen took it over. We have found that a queen cell protected by a spiral cell protector may be successfully given to Apis indica colonies that contain laying workers. The top and bottom of the protector may be left open. We also give a frame of brood so that the virgin will have some young workers when she emerges. Brood always helps to keep the colony from absconding. We have had little success persuading colonies containing laying workers to produce queen cells from open brood. We either give them a protected queen cell or unite them with a strong colony which contains a good queen.

This year we have observed three colonies of rock bees, A. dorsata, which contained laying workers. They layed many eggs in each cell in a manner similar to that of the Indian and European bee laying workers. One colony had a piece of comb about a foot square which was filled with emerging drones. Some of these drones could manage to squeeze through the 5 millimeter space which held back the larger drones produced by a fertile queen. Except for this slight reduction in size these drones appeared similar in all respects to those produced by the fertile dorsata queen.

When Writing to Advertisers Mention Gleanings

This photo shows a portion of one of our queen yards, containing over 6,000 nuceli.

ITALIAN BEES AND QUEENS

2-lb pkg. with qns., $3.00; 3-lb. pkg. with qns., $4.00. Extra qns., $1.00.

OVERBEY APIARIES - Bunkie, Louisiana

WORK OF U. S. BEE CULTURE FOR 1941

(Continued from page 25)

higher in sucrose when first gathered, and showed marked change after being kept at 36° for 5 months.

Under a humidifier an Acala cotton plant yielded involucre nectar in quantity, each gland yielding 54 microliters. The sugar content was 17 to 24 percent. A floral nectary of this plant yielded much less nectar with a sugar content of but 7 percent, whereas its leafgland nectar contained 12 percent of sugar. Unlike the vetch and acacia, the extra floral nectaries did not yield until after the flowers appeared. Cotton plants observed at Davis, Calif., yielded insufficient nectar to attract bees.

The value of bees in the pollination of alfalfa has been questioned because they do not trip the alfalfa blossoms. It is of interest, therefore, that bee-trapped pollen in the Imperial and Salt River Valleys in California showed large quantities of alfalfa pollen, whereas this pollen was not found in traps in other parts of California, the Rouge River Valley of Oregon, or Nevada.

TALKS TO BEEKEEPERS

(Continued from page 51)

the main honey flow unless the hive is queenless or has an unmated queen.

Bees to Carry a Pound of Honey

Actual weighings have shown that it takes about 20,000 bees to bring in a pound of nectar, which will make about one-fourth as much honey. It would, therefore, take 80,000 bees to bring in enough nectar, when evaporated and modified by bees, to equal a pound of honey. It has been estimated that it takes 80,000 more bees to evaporate and modify four pounds of nectar into honey. According to these figures it takes 160,000 bees to gather and prepare a pound of honey in a given period of a few hours or a day.

The average flying distance for a bee load may be a mile and a half. If one bee could gather enough nectar (four pounds) to make one pound of honey it would have to make 80,000 trips of one mile each, or fly a distance equal to more than three times around the globe.

THIS YEAR

Will be a momentous one in world affairs and none of us can forsee just what will happen. We want you to know that we will make every effort to produce all of the bees and queens we possibly can, and also keep up the high standard of quality we have always maintained at a reasonable price.

The Stover Apiaries, Mayhew, Miss.

Pettit's Package Bees With Queens

Who is Pettit? Why, Morley Pettit, first in America to bear the title of State Provincial Apiarist; Founder of the Apiculture Department at the Ontario Agricultural College; Practical honey producer from childhood; Successful shipper of bees in Georgia for eighteen years; Old enough to know how; Young enough to see that you get good service. Ask our many satisfied customers.

Prices for 1943 with queen in each package.

Quantity	Twos Each	Threes Each	Fours Each	Fives Each	Extra Queens Each
1- 23	$2.95	$3.85	$4.75	$5.60	$ .95
24- 99	2.80	3.65	4.50	5.30	.90
100-499	2.65	3.45	4.25	5.00	.85
500 up	2.50	3.25	4.00	4.70	.80

Book orders and reserve dates soon. Send Cash in US funds ten days before shipping date.

We offer prompt service

Best Young Queens — Gentle Italians
No Drones — Hard Workers
New Cages — Safe Arrival

Our best friends are satisfied customers.

Morley Pettit - - Tifton, Georgia, U. S. A.

PACKAGE BEES

With CARNIOLAN or ITALIAN QUEENS. HONEY TEST QUEENS will be furnished with all packages. Write for 1943 prices.

EPHARDT'S HONEY FARMS, PLAUCHEVILLE, LA.

Order Your Supplies Early

24-Hour Service No Longer Possible

YES, WE HAVE a good stock of all wood supplies excepting Buckeye hives.

We also have a stock of foundation, drill gloves, veils, spur imbedders, wax tube fasteners, and a limited stock of knives, smokers and hive tools. We have also a very limited stock of wire which will be rationed. Most other metal items may not be available.

NOTE: Your orders will be given prompt attention but shipping is congested and will get worse so do not anticipate delivery of goods under two to three weeks.

The A. I. Root Company
12 West 21st Street
NEW YORK CITY

Root Service from Chicago

For nineteen forty-three

Production

is the watch-word. This business will help. We will do so by stocking needed supplies in advance as they may be available.

We cannot obtain all items but will approach a complete list as much as possible.

Do you need hives, supers, frames, sections, hive parts, and foundation? Write us about your needs. Try us on your list of things wanted. We will do the best possible with it.

We want honey and beeswax. Will be glad to receive for cash or trade.

A. I. Root Co. of Chicago
224 West Huron Street
Chicago, Ill.

QUEENS

Italians **Daughters of Resistant Stock** **Caucasians**

PACKAGE BEES

Prices on Package Bees With Queens to May 21st.

Lots of	Queens	2-lb bees	3-lb.	4-lb.	5-lb.
1 to 24	$.90	$2.95	$3.80	$4.60	$5.35
25 to 99	.85	2.80	3.60	4.35	5.05
100 to 499	.80	2.65	3.40	4.10	4.75
500 up	.75	2.50	3.20	3.85	4.65

For Tested queens, double the price of untested.

BOOKING ORDERS NOW

Over 25 year's experience shipping. Paying 45 cents a pound for Beeswax in exchange for bees and queens. If you have over 50 pounds, write for shipping instrustions. TRUCKERS HEADQUARTERS drive in 3½ miles south of Weslaco on Progresso Highway.

BLUE BONNET APIARIES, Rt. 1, Box 70, Mercedes, Tex.

BETTER-BRED QUEENS Three-banded Italians

Be prepared for 1943 by booking your orders early, and by buying our improved stock of bees.

	Queens	2 lb.	3 lb.	4 lb.	5 lb.	all with queens.
1 to 24	$.90	$2.95	$3.80	$4.60	$5.35	
25 to 99	.85	2.80	3.60	4.35	5.05	
100 to 499	.80	2.65	3.40	4.10	4.75	
500 up	.75	2.50	3.20	3.85	4.45	

CALVERT APIARIES, CALVERT, ALABAMA

BUILDING FOR THE FUTURE

(1) "Rome wasn't built in a day".

(2) Consumer interest in honey isn't developed in a day.

(3) **The Beekeeper's Best Friend, The American Honey Institute**, has been developing and maintaining interest in honey for over 14 years.

(4) Work done by our Institute is bearing fruit and will continue to do so during the years ahead.

(Help yourself by helping the Institute)

Send contributions to

THE AMERICAN HONEY INSTITUTE

Madison, Wisc.

GLEANINGS MARKET PLACE

The following listings are made as a service to our yearly subscribers. (No honey or package bees). All listings must be sent in before the 10th of the month. Transactions are between owner and buyer.

— — —

Root Section Press and Sections. Wm. Gabriel, R. D. 1, Sioux Falls, S. D.

— — —

750 Queen mating hives, each holds 3 standard frames, built in bottom board feeders, one piece cleated covers. Extra good condition, swarm boxes, excluders, cell bars complete, queen rearing outfit. For particulars write Gooch Apiaries, Farmersville, Tex.

— — —

One Junior Brand capping melter latest model, complete with extras. $25.00. John L. Tideswell, 2711 N. 63 rd St. Omaha, Nebr.

GLEANINGS IN BEE CULTURE

Quality Bred Three-Banded Italians. Bees and Queens

Customers with lifetime experience in rearing queens and shipping package bees. You can't find anyone who will serve you better than I can. Get in touch with me now for prices.

Farris Homan

Shannon, Miss.

TOO LATE TO CLASSIFY

WANTED Employment as queen breeder or honey producer. Twenty years' experience. Now 45 years old. Write me your offer contingent on my release or discharge from Army, Pvt. Heber E. Coffey, Co. "C," 51 Med. Tng. Bn., First Platoon, Camp Barkeley, Texas.

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